



FRIDAY, JUNE 24, 1881.

Train Accidents in May.

The following accidents are included in our record for the month of May:

REAR COLLISIONS.

On the morning of the 3d a passenger train on the Boston & Lowell road ran over a misplaced switch and into the rear of a freight train on a siding in Woburn, Mass. The engine and several cars were damaged, a man standing on the platform of a passenger car killed.

On the 6th a freight train on the Troy & Boston road broke in two near North Adams, Mass., and the rear section ran into the forward one, damaging several cars.

On the afternoon of the 6th a passenger train on the Chicago, Burlington & Quincy road ran over a misplaced switch and into a yard engine standing on a siding in Galesburg, Ill. Both engines were wrecked, the passenger engineer and another man hurt.

On the evening of the 6th, as a freight train on the Chicago, Burlington & Quincy road was approaching Otter Creek, Ill., the engine was cut loose and ran ahead to the tank to take water. The brakemen were unable to stop the train in time, and it ran into the engine, piling 15 cars up on the tender in a bad wreck. A brakeman was killed and three others slightly hurt.

On the evening of the 9th a freight train on the Baltimore & Ohio road broke in two near Finken Tunnel, Pa., and the rear section ran into the forward one, wrecking several cars, and killing a tramp who was stealing a ride.

On the night of the 10th a coal train on the New York, Lake Erie & Western road broke in two near Pond Eddy, Pa., and the rear section afterward ran into the forward one, wrecking two cars.

On the afternoon of the 11th a freight train on the Pennsylvania Railroad ran into the rear of a repair train near Turtle Creek, Pa., wrecking several cars.

On the afternoon of the 12th, as a passenger train on the Hanover Junction, Hanover & Gettysburg road was making a flying switch at Emory Grove, Md., the tender jumped the track and the train ran into it, wrecking it, damaging the engine and a car. A passenger was slightly hurt.

On the night of the 16th as a passenger train on the Pennsylvania railroad was running into the yard at Altoona, Pa., for some reason the brakes failed to work, and the train ran past the station at high speed and into an engine and express car which were standing on the main track waiting to take the train east. The express car was wrecked and both engines badly damaged.

On the night of the 17th a freight train on the New York, Lake Erie & Western road ran into the rear of a preceding freight near Attica, N. Y., damaging the engine and several cars, injuring the engineer and fireman.

On the evening of the 18th as a freight train on the Central Pacific was making a flying switch at Promontory, Utah, the detached cars ran into the forward ones, damaging several cars.

On the morning of the 20th a freight train on the Louisville & Nashville road broke in two at Muldraugh's Hill, Ky., and the rear section ran into the forward one, wrecking 10 cars.

On the afternoon of the 20th a boy started a yard engine on the Delaware, Lackawanna & Western road at Oswego, N. Y., and it ran down the track and into some freight cars, wrecking one and injuring a laborer who was unloading it.

On the morning of the 27th a freight train on the Denver & Rio Grande road ran into the rear of a repair train near Granite, Col., wrecking several cars, killing three laborers and wounding two others. The freight train had orders to look out for the other, but disregarded them. The engineer and fireman ran away.

On the afternoon of the 28th the pay train of the Illinois Midland road ran into the rear end of a Wabash, St. Louis & Pacific freight in Peoria, Ill., wrecking the engine and a caboose. The fireman was badly hurt.

Near midnight on the 30th a freight train on the Pennsylvania Railroad ran into a preceding freight near Monmouth Junction, N. J., damaging several cars and injuring three trainmen.

BUTTING COLLISIONS.

On the night of the 4th an east-bound passenger train on the New York, Lake Erie & Western ran over a cross-over switch near Rutherford, N. J., which had been purposely set wrong, and upon the opposite track. Before it could be stopped it met a westbound freight and both engines were badly broken. The switch rods had been broken, leaving the signals right.

On the 5th there was a butting collision between two freight trains on the Michigan Central road, near Chelsea, Mich. Both engines and several cars were damaged, and an engineer hurt.

On the morning of the 6th there was a butting collision between a passenger train and a freight train on the Wabash, St. Louis & Pacific road, at Illiopolis, Ill., by which both engines and several cars were wrecked, and two trainmen hurt. The freight train was trying to reach the siding and had sent forward a signal, which was not seen on account of a heavy fog.

On the afternoon of the 12th there was a butting collision between two freight trains on the Pittsburgh, Cincinnati & St. Louis road, near Hanlin, O. Both engines and several cars were wrecked, both engineers and both firemen slightly hurt.

On the night of the 13th as a freight train on the Illinois Midland road was backing up to get a fresh start up a grade near Waynesville, Ill., it met a following freight, and an engine and four cars were badly broken.

On the 21st there was a butting collision between a Michigan Central and a Detroit, Lansing & Northern freight on the track used by both roads in Lansing, Mich. Both engines and several cars were badly broken, and the wreck partly destroyed by fire.

On the morning of the 24th there was a butting collision between a passenger train and a wild engine on the Hudson Branch of the Boston & Albany road near Ghent, N. Y. Both engines were wrecked, the engineer and the fireman of the passenger train killed. It is said that the engineer of the wild engine had been warned to look out for the other train.

On the evening of the 28th there was a butting collision between two freight trains on the Baltimore & Ohio road at Plymouth, O., by which both engines and several cars were wrecked. Two trainmen were hurt.

CROSSING COLLISION.

On the 16th a freight train on the Cincinnati, Sandusky & Cleveland road ran into a Cleveland, Columbus, Cincinnati & Indianapolis freight at the crossing in Bellefontaine, O., wrecking two cars.

DERAILMENT, BROKEN RAIL.

On the 11th a freight train on the Houston & Texas Cen-

tral road was thrown from the track near Hockley, Tex., by a broken rail.

DERAILMENTS, BROKEN WHEEL.

On the 8th several cars of a freight train on the Grand Trunk road were thrown from the track near Georgetown, Ont., by a broken wheel.

Very early on the morning of the 18th a car of a freight train on the New York, Lake Erie & Western road was thrown from the track near Guymard, N. Y., by a broken wheel.

DERAILMENT, BROKEN AXLE.

On the morning of the 1st a passenger train on the New York, Lake Erie & Western road was thrown from the track near Hancock, N. Y., by the breaking of an axle under the tender.

On the 11th the engine of a passenger train on the New York, Lake Erie & Western road was thrown from the track near Turners, N. Y., by the breaking of an axle.

On the morning of the 13th the engine of a milk train on the New York, Lake Erie & Western road was thrown from the track near Monroe, N. Y., by the breaking of an axle.

On the afternoon of the 14th eight cars of a freight train on the Cleveland, Mt. Vernon & Delaware road were thrown from the track near Millersburg, O., by a broken axle, making a bad wreck.

On the morning of the 17th several cars of a freight train on the Northern Central road were thrown from the track near Parkton, Pa., by the breaking of an axle. Several cars were wrecked, and the wreck caught fire, burning up five oil-tank cars.

Early on the morning of the 19th several cars of a freight train on the Lehigh Valley road were thrown from the track at East Penn Junction, Pa., by a broken axle. An oil car caught fire, and 13 cars were destroyed.

On the evening of the 24th several cars of a coal train on the Pennsylvania Railroad were thrown from the track at Big Conestoga Bridge, Pa., by the breaking of an axle.

On the 26th several cars of a freight train on the Chicago & Alton road were thrown from the track near McLean, Ill., by a broken axle.

DERAILMENTS, BROKEN TRUCK.

On the afternoon of the 15th several cars of a freight train on the New York Central & Hudson River road were thrown from the track near Fort Plain, N. Y., by the breaking of a truck.

On the afternoon of the 19th several cars of a freight train on the Chicago & Northwestern road were thrown from the track near Geneva, Ill., by a broken truck.

DERAILMENTS, BROKEN BRIDGE.

On the afternoon of the 1st a special passenger train on the New York & Greenwood Lake road broke through a trestle bridge over the Wanaque River, near Ringwood Junction, N. J., and fell 40 feet to the river. The engine was wrecked, the engineer killed, and the fireman hurt so that he died next day. The bridge had been reported to be unsafe for some time, and men had begun to repair it. It is said that the engineer hesitated to cross, but the bridge foreman told him to go on.

On the morning of the 3d a freight train on the Texas & Pacific road broke through a bridge near Sweetwater, Tex., and was wrecked, killing the engineer and fireman, injuring the conductor and a brakeman. The piers had been partly washed out by a freshet.

Very early on the morning of the 7th a freight train on the Green Bay and Minnesota road broke through a bridge near Centralia, Wis., which had been partly burned by a slow fire, the ties and rails remaining in place while the stringers were nearly burned through. The engine passed nearly across and fell, and ten cars went after it and were piled up in a bad wreck. The engineer, fireman and a brakeman were hurt. The wreck caught fire and was destroyed.

On the afternoon of the 14th a passenger train on the Terre Haute & Logansport road ran through a trestle which had been partly washed out by a freshet near Cutler, Ind. The engine and two cars went down, killing the fireman, injuring the engineer and express messenger badly and six others slightly.

On the afternoon of the 18th a freight train on the Baltimore & Ohio broke through the bridge over Wheeling Creek, in Wheeling, W. Va. One span of the bridge went down and the engine and two cars fell with it and were wrecked. The engineer was badly hurt. The bridge was believed to be in good order.

DERAILMENTS, SPREADING OF RAILS.

On the morning of the 3d a passenger train on the St. John & Maine road was thrown from the track near Fredericton Junction, N. B., by the spreading of the rails, and ran upon the ties on the bridge over the Oromocto River. An express car broke loose and went off the bridge into the water. The engineer was hurt.

About noon on the 18th a passenger train on the New York Central & Hudson River road was thrown from the track near Lockport, N. Y., by the spreading of the rails. The engine and two cars went into the ditch and were wrecked, injuring four persons.

On the afternoon of the 21st a passenger train on the Atlantic & North Carolina road was thrown from the track near Falling Creek, N. C., by the spreading of the rails. One car was badly broken.

On the 31st a freight train on the New Haven & Northampton road was thrown from the track near Westfield, Mass., by the spreading of the rails, said to have been caused by expansion from the heat.

DERAILMENT, ACCIDENTAL OBSTRUCTION.

On the morning of the 19th several cars of a passenger train on the European & North American road were thrown from the track at Tomah, Me., by some wood which had fallen from a pile beside the track.

DERAILMENTS, CATTLE.

On the morning of the 2d a passenger train on the Cleveland, Columbus, Cincinnati & Indianapolis road, ran over a cow near Alexanderville, O., and the engine and four cars were thrown from the track.

On the evening of the 9th a freight train on the Cleveland & Pittsburgh road ran over two horses at Gillespie Bridge, O., and the engine and four cars went down a bank. The engineer and fireman were badly hurt.

Early on the morning of the 10th a passenger train on the Indiana, Bloomington & Western road ran over a cow near Brownsburg, Ind., and nearly all the train went down a bank, wrecking the engine and two cars, injuring the fireman and two passengers.

On the 15th the engine of a freight train on the Oregon Railway & Navigation line was thrown from the track near Walla Walla, Washington Ter., by running over a cow.

On the morning of the 17th a freight train on the Chicago, Milwaukee & St. Paul road was thrown from the track near Genoa, Ill., by some cows on the track.

Very early on the morning of the 21st a passenger train on the Cincinnati, Indianapolis, St. Louis & Chicago road ran over some cows and was thrown from the track and down a bank. The fireman was thrown under the engine and badly hurt.

Near midnight on the 28th a freight train on the Memphis & Little Rock road struck a cow on the track near Looske, Ark., and the engine was upset into the ditch and badly broken. The engineer was badly hurt; he was caught under the engine in such a way that he could not be got out till noon next day.

DERAILMENTS, WASH-OUT AND LAND-SLIDE.

On the night of the 3d a freight train on the Texas & Pacific road ran into a wash-out near Katula, Tex., and was wrecked, killing three trainmen.

On the 7th a freight train on the Atchison, Topeka & Santa Fe road ran into a wash-out near La Junta, Col. The engine and several cars were wrecked, a trainman killed and two others hurt.

On the afternoon of the 30th a freight train on the Chicago, St. Paul, Minneapolis & Omaha road ran into a landslide just made by a water-spout near Belle Plain, Minn., throwing the engine and eight cars into the ditch. One man was hurt.

DERAILMENT, MISPLACED SWITCH.

On the evening of the 3d a freight train on the Connecticut River road was thrown from the track in Greenfield, Mass., by a misplaced switch, wrecking the engine and 12 cars.

On the afternoon of the 12th the engine and several cars of a coal train on the Lehigh Valley road were thrown from the track at Pattenburg, N. J., by a misplaced switch.

On the afternoon of the 25th a repair train on the Delaware, Lackawanna & Western road was thrown from the track in Binghamton, N. Y., by a misplaced switch. The engine ran on the ties to the end of the bridge over the Susquehanna and struck one end of a truss, knocking down one span and wrecking it completely. The bridge was a wooden truss.

On the afternoon of the 30th a passenger train on the Pennsylvania Railroad ran over a misplaced switch at Bear Swamp, N. J. The engine kept the track, but two cars ran off and upset, the second passing over the first and crushing it badly. Two passengers were killed and 16 hurt. The switch was at the end of a long section of fourth track and had the usual signal and a distant signal besides. The engineer claimed that the signals showed all clear, but the weight of evidence is against him. The train was running at the rate of nearly 50 miles an hour when it struck the switch.

MALICIOUS DERAILMENTS.

On the morning of the 4th a passenger train on the Troy & Boston road was thrown from the track at Eagle Bridge, N. Y., by a switch which had been purposely misplaced.

On the afternoon of the 8th the engine and one car of a passenger train on the Georgia railroad were thrown from the track near Hardin Creek, Ga., by a heavy stone and tie which had been placed on the track on a sharp curve. The engine upset and was damaged.

On the 22d the engine of a passenger train on the Chicago, Milwaukee & St. Paul road was thrown from the track near Horicon, Wis., by a rail and some ties piled on the track. The trainmen caught two boys who are believed to have placed the obstructions.

UNEXPLAINED DERAILMENTS.

On the 4th a construction train on the Cincinnati Northern road ran off the track near Norwood, O.

On the 4th five cars of a freight train on the Nashville, Chattanooga & St. Louis road jumped the track on a trestle in Nashville, Tenn., and two of them went over the trestle, falling to the ground, and were wrecked.

On the night of the 5th four cars of a passenger train on the Chesapeake & Ohio road off the track near Staunton, Va., and the engine and one car upset.

On the morning of the 7th the engine and two cars of a freight train on the Pennsylvania Railroad ran off the track near Bolivar, Pa., blocking the road an hour.

On the morning of the 9th 12 cars of a freight train on the Cincinnati Southern road were thrown from the track near Eubank, Ky., and several of them wrecked.

On the morning of the 10th two cars of a freight train on the New Haven & Northampton road ran off the track near South Deerfield, Mass., and went down a bank.

On the morning of the 11th the engine of a passenger train on the New York & Greenwood Lake road ran off the track near Montclair Heights, N. J., blocking the road several hours.

On the morning of the 12th a construction train on the Cincinnati Northern road ran off the track near Norwood, O., wrecking several cars.

On the morning of the 13th the engine of a freight train on the Atchison, Topeka & Santa Fe road was thrown from the track near Topeka, Kan., and upset, killing the engineer.

On the afternoon of the 13th several cars of a freight train on the Wabash, St. Louis & Pacific road ran off the track near Macon, Mo., and were wrecked, injuring two men in the caboose.

On the night of the 18th a freight train on the New York, Pennsylvania & Ohio road ran off the track near Geauga Lake, O., wrecking several cars.

Very early on the morning of the 19th two cars of a freight train on the New York, Pennsylvania & Ohio road ran off the track near Mahoning, O., and were wrecked.

On the morning of the 24th a freight train on the Chicago, Milwaukee & St. Paul road ran off the track near Sherman, Ill., blocking the road four hours.

On the night of the 25th a freight train on the Chicago, Milwaukee & St. Paul road ran off the track near Reeseville, Wis., blocking the road two hours.

On the 26th a freight train on the Lake Erie & Western road ran off the track near Muncie, Ind., killing a fireman.

On the afternoon of the 26th the engine and two cars of a freight train on the New Haven & Northampton road ran off the track near Holyoke, Mass., and were badly damaged.

On the 27th a freight train on the Louisville, New Albany & Chicago road ran off the track near Chalmers, Ind., wrecking 14 cars, killing a brakeman and injuring two boys who were stealing a ride.

On the evening of the 31st a car of a coal train on the New York Central & Hudson River road jumped the track on the bridge over the canal in Rochester, N. Y., and nine cars were piled up together and wrecked, killing a boy who was stealing a ride.

BOILER EXPLOSIONS.

On the morning of the 27th, as a passenger train on the Illinois Central road was near Monee, Ill., and running at a good speed, the boiler of the engine exploded, tearing out all the front part of the boiler and wrecking the front end of the engine. The fireman and a boy were hurt. The engine and train ran nearly half a mile after the explosion.

On the morning of the 30th the boiler of a freight engine on the Nashville, Chattanooga & St. Louis road exploded while standing in the yard at Chattanooga, Tenn., waiting to go out with a train. The front part of the boiler was torn to pieces and fragments were thrown to a great distance. The fireman was killed and a car inspector in the yard was also killed by a flying piece of iron. The engineer, who stood by the rear driver, and a passer-by, were hurt. The engine was a Danforth Mogul, seven years old, and subsequent examination showed no defect in the boiler that could be seen. The engineer said the gauge stood at 147 lbs. a few minutes before.

This is a total of 85 accidents, whereby 24 persons were

killed and 76 injured. Fifteen accidents caused the death of one or more persons; 21 caused injury but not death, while in 49 cases, or 57.6 per cent. of the whole number, there was no injury serious enough for record.

As compared with May, 1880, there was an increase of 39 accidents, but a decrease of six in the number killed and of 31 in that injured.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:	
Rear collisions.....	16
Butting collisions.....	8
Crossing collision.....	1
	—25

DERAILMENTS:	
Broken rail.....	1
Broken wheel.....	2
Broken axle.....	8
Broken truck.....	2
Broken bridge.....	5
Spreading of rails.....	4
Accidental obstruction.....	1
Cattle.....	7
Wash-outs.....	1
Land-slide.....	2
Misplaced switch.....	1
Purposely misplaced switch.....	1
Malicious obstruction.....	2
Unexplained.....	18
	—58

Boiler explosions.....	2
Total.....	85

Four collisions were caused by trains breaking in two; two by misplaced switches; two by flying switches; two by mistakes or disobedience of orders; one each by failure of brakes, by a runaway engine, by fog, by failure to use signals and by a purposely misplaced switch.

A division according to classes of accident and trains is as follows:

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains.....	3	16	1	20
To a pass. and a freight.....	7	22	1	7
To freight trains.....	15	42	1	58
Total.....	25	58	2	85
Casualties:				
Killed by.....	8	14	2	24
Injured by.....	24	48	4	76
Total.....	32	62	6	100

Two things are noticeable with regard to the record for the month. The first is that an unusual number of breakages of rolling stock are recorded for a month so near the summer, while there are few of the causes of accident usually prominent in the spring months. The other is that the number of accidents is very large for May, which has been for several years the lightest month in the year. For this there is no apparent cause in the weather of the month, which was on the whole pleasant and free from unusual storms; cooler than usual, perhaps, but certainly free from any of those extremities of temperature to which accidents are often attributed. The eight broken axles and the two broken trucks are possibly a sign of a tendency to overwork the equipment, both by overloading cars and by running engines and cars when they need repairs. For the overwork there may be some excuse on a road which has more traffic than its machinery is equal to, but overloading should be more strictly guarded against. The tendency to increase train and car loads has its advantages in railroad economy, but is liable to serious abuses, for which a strict watch should be kept.

As the number of broken bridges is unusual, it may be noted that one had been partly destroyed by an undetected fire, and two failed from the washing out of their substructure. One failed from some unassigned or unknown cause, while one, we fear, failed simply because its owners either did not or would not remember that wood will in time decay and must be renewed.

A general classification shows 26 accidents which are attributed directly to defect or failure of road or equipment; 6 directly to the weather; 9 to accidental causes hardly to be foreseen or prevented; 22 to carelessness of trainmen or defective management; 4 maliciously caused, and 18 unexplained.

Six accidents—four derailments and two collisions—were due to carelessly misplaced switches; not as many as we sometimes have to record, but enough to make this form of carelessness much more prominent than it should be.

The most unpleasant feature of the month is the four accidents maliciously caused. Two of them were derailments by obstructions placed on the track; one a derailment by a switch forced open by the wreckers, while the fourth was a collision caused by the opening of a cross-over switch, throwing a fast passenger train at night over on the wrong track. This last was the only accident of the kind that we can now recall.

It may be noted that the collisions were in unusually small proportion to the whole number of accidents. A larger proportion of the collisions than usual were butting collisions.

As to time there were 57 accidents in daylight and 21 in darkness, while in 7 cases the time is not definitely fixed.

For the twelve months making up the year ending with May the figures given in our record are as follows:

	Number of accidents.	Killed.	Injured.
June.....	15	36	77
July.....	78	21	100
August.....	112	49	214
September.....	124	15	54
October.....	120	69	137
November.....	145	40	165
December.....	135	29	141
January.....	223	30	182
February.....	149	27	253
March.....	113	38	177
April.....	63	22	66
May.....	85	24	76
Totals.....	1,403	379	1,642
Total, same months, 1879-80.....	869	205	731
1878-79.....	802	200	797

The averages per day for the month were 2.74 accidents.

0.77 killed and 2.45 injured; for the year they were 3.84 accidents, 1.04 killed and 4.50 injured.

The average casualties per accident were, for the month, 0.282 killed and 0.894 injured; for the year, 0.270 killed and 1.170 injured.

The averages per month for the year were 117 accidents, 32 killed and 137 injured, against a similar average of 72 accidents, 17 killed and 61 injured in 1879-80, or 67 accidents, 17 killed and 66 injured in 1878-9. The increase this year is large.

Contributions.

Notes by the Way.

THE CHICAGO, BURLINGTON & QUINCY—IOWA DIVISION.

BURLINGTON, Iowa, 1881.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The Chicago, Burlington & Quincy road is in an interesting stage of progress from a single to a double track line; and I purpose, if my discretion will only prove equal to my courage, to give the readers of the *Railroad Gazette* several noteworthy features of the change as presented, more especially in the Iowa Division.

On the Chicago-Galesburg (Ill.) Division the grades are comparatively light, few exceeding 53 ft. to the mile. On the Iowa Division many of the grades are 70 ft.; and the division may be described as an attempt to get across a plowed field at right angles to the furrows. This, of course, is an exaggerated figure, but it will serve to impress the facts on the imagination.

This division finds but three valleys favoring its line, two of them offering no great facilities for a road bed, the valleys of the Avery, the Cedar and the Nodaway.

Of course there are numerous stretches of level country on the top of divides, but the peculiar features of the division lies in the fact that it cuts its very many water-courses at nearly right angles. The main line once constructed, it is comparatively easy to send feeders up the valleys or on top of the divides, and this is one reason why the branches of this road exceed in total its length of through line. If, however, these up-and-down branches had been laid as a second and parallel main track the total cost would have been several times as much money for the same length of track.

The Double Tracks of the Main Line.—On the Chicago-Galesburg Division there is a continuous double track to Aurora, 38 miles, and several lengths of it between Aurora and Galesburg; but in the main, convenience rather than circumstances of grade has determined their location.

On the Iowa Division the placing of a second track has been used largely as an opportunity to lower the grade, the new track forming the ascending, the old track the descending line.

Kirfman's to Albia.—Between Kirfman's and Albia the old line has a sharp grade of 70 ft., the new line bends northward and ascends by a longer grade of 35 ft., descending by the old line track. West-bound trains, therefore, in taking their right-hand (or north) track are favored with an easier grade, while east-bound trains find their way down their right-hand (or south) track, whose 70 ft. to the mile, of course, is no obstacle to their descent.

On the west side of the same divide a similar new line ascends from Monroe, and bending southward where the old line bends to the north, it fails to reach the Albia depot, and passes it by through a deep cut some distance to the south. It then approaches the old line, joins it and descends by it to Kirfman's at the foot of its eastward grade.

For east-bound trains, this line of new ascending and old descending grades is the right-hand track, but it is taken only by through trains. East-bound passenger and local freight trains take the left-hand or old line track and its heavy grade. The length of this section (or sections) of double track is 14 miles; it was built in 1878.

Zero to Russell.—A still more interesting construction of track was made in 1879, at the part of the division where the old line took the north bank of a branch of Cedar Creek, with a 70 ft. grade for a considerable portion of three miles, while the new line found its natural course and a grade of 35 ft. on the south bank. This reversed the positions of the old and new lines; for in order to get the advantage of every grade it was necessary for trains to take the left-hand track.

Melrose to Zero.—In 1880 another section of second track, about three miles long, was constructed from Melrose to the junction of the new track of 1879 near Zero, by which that little town was not inappropriately left out. The question arose, however, where should this left-hand track be entered upon—should it be extended eastward with each new section of second track, or should the trains cross at Melrose? The latter alternative was decided upon, and trains take the south track at Melrose, entering on the single track at Russell, about six miles west. The masonry for a second track from Russell to Chariton is already laid, and when completed, the tracks will cross at Russell also.

Other Sections.—From Munroe to Tyrone five miles of second track are now building, and will be completed within the year. From Tyrone to Melrose (six miles) there is a second construction contemplated for 1882, which, with the completion of the section from Russell to Chariton (seven miles), will give 42 continuous miles of quadruple rail from Kirfman's to Whitebreast, a short section from Chariton to Whitebreast (three miles) having been laid as early as 1878. I may add, there is a short section of double track from Burlington to Leffler's (three miles), located for convenience merely.

THE NEW SHOPS.

The shops of the Iowa Division are at Burlington, but they

are little more than a group of old wooden sheds. One is surprised to find that in such quarters not only are the heavier repairs of the division made, but even new engines are built. Better accommodations, however, are in preparation in the new shops now building at Leffler's. The company owns at this point a tract 700 × 3,000 ft., situated on high ground, and on this the buildings will be arranged somewhat in the following order: A freight-car erecting shop, 90 × 220 ft., partly flanked by a wood-shop and planing mill, 70 × 200 ft.; back of the freight-car shop a passenger-car erecting shop, 90 × 220 ft., and in its rear again, a paint-shop, 90 × 250 ft. In a line with the passenger-car shop, on the other side of the grounds, a machine-shop and locomotive erecting shop, 120 × 300 ft., flanked by the store-house (and office), 50 × 350, and in rear of the machine-shop, the smith-shop and boiler-maker's shop, 120 × 200 ft. Finally, the engine and boiler-house and the oil-house, centrally located.

The buildings thus group themselves in three lines; the first being formed by the store-house, which lies parallel with and about 70 feet from the main track. The second line is made up of the locomotive-erecting and machine-shop in one building, and the boiler and smith shops in another building of equal width and proportions, but shorter. The third line contains the wood-shop, the passenger and freight car erecting shops, and the paint-shop. Between the second and third lines are placed the oil-house and the engine and boiler-house, containing the motive and heating power for the whole works.

In addition to these, a large tank is placed centrally on the grounds, also between the second and third lines, and the round-house—8 stalls of a 30-stall house—fills an otherwise unavailable corner of the tract. The dry kiln occupies an independent position convenient to the wood-shop, while the lumber yard is placed well away from the buildings, but so arranged as to have a down grade for the connecting tracks between it and the wood-shop.

The buildings will be of brick. The foundations of some of them are already laid.

SOME SHOP DETAILS.

Before the plans were drawn, Chief Engineer McClure, General Master Mechanic Stone, and the Division Master Mechanic, visited nearly all the leading shops of the country, and have made good use of what they found, as well as of the suggestions growing out of their own experience.

The general plan and design is original; the erecting (locomotive) shop is modeled after that of Altoona, and like it, will have a "traveler;" the car shops will have the Altoona "pits," and have been modified by the suggestions of the Division Master Mechanic, but will resemble those at Aurora; the heating apparatus is that of Aaron Wolf, which is used in the car works at Pullman, as is the patented dry kiln which has been chosen. The shifting tables will be run by cables, worked from the engine-house after a method not without resemblance to that used by the New York Central road at its shops in West Albany. At these shops the shifting platform is moved to and from the track-connections by cables, and if we are not mistaken, another cable, or set of them, loads the platform with the car or locomotive which is to be shifted.

It is probable that a village will soon grow up around the shops, and I take this early opportunity to suggest that it will afford an excellent opportunity to form a co-operative society of the kind which Mr. Holyoke has told us so much about. In any case it will be a great advantage to have the shops situated at a point which will induce the men to live out of Burlington. Burlington is not a large city, nor can I give more than a series of general impressions as my evidence, but I am inclined to believe one soon discovers the influence of city life on the laboring men of any department of a shop or a railroad. The men are poor, everything goes in house rent and extras, they are less respectful, and the early shades of overcoming evil are at least more apparent. Every shop should be built in the open country, and the men encouraged to build. I have recently seen evidence in several cases of the excellent financial benefits, to say the least, which had come from a young man's attempting to own a home of his own.

CRESTON.

There is already at Creston a large round-house (a full circle) of 60 stalls. This will be somewhat changed to adapt it better to shop purposes, and it is contemplated to build near it a full complement of shops like those now building at Leffler's. A store-house, 50 × 150, and a locomotive-erecting and machine-shop, 60 × 200, will be built this year.

TRAFFIC.

It is hardly necessary to say that these plans are merely the necessary result of the Chicago, Burlington & Quincy's increasing traffic. Already the road is kept busy beyond its normal capacities with its present equipment; its engines are constantly on the road, and its men have barely sufficient time for rest. I have heard no complaints of excessive overwork, probably because they are allowed to throw out one or more runs whenever they become wearied. X. Y. Z.

Raoul's Journal-box.

Considering the importance of the functions which car-journal boxes must perform, and the extent to which they are used, it must be admitted that they are very imperfect contrivances. The means provided for keeping them lubricated are very rude and imperfect; the dust-guard, which is intended to keep the dust out and the oil in the box, is somewhat of a comedy in mechanics. In the construction of shafting it has been found to be of the utmost importance that the bearings should be self-adjusting, to secure uniform wear and prevent heating. The service which a car-journal must perform is many fold more severe than that required

of shafting, and the exposure and neglect much greater, and yet there is rarely any means provided by which the bearing of a car box can adjust itself to the journal, excepting that which lost motion and bad workmanship will permit. The unequal wear of journals shows how imperfect the adjustment of the bearing often is. The lateral shocks of a car subject the journals and bearings to an enormous amount of end wear. The means ordinarily provided to resist this wear are a small collar on the outside and a shoulder on the inside end of the journal. The insufficiency of these is shown by the manner in which they cut into the bearings. The invention represented by the engravings is intended to remedy this defect, and to provide bearings on the outer ends of the axles to resist their lateral motion. Various plans have been proposed for doing this, one of which was illustrated in the *Railroad Gazette* of June 7, 1878, and others are shown by figs. 145 and 146 of the "Car-Builders' Dictionary." The plan illustrated herewith, which is the invention of Mr. W. G. Raoul, of Savannah, Georgia, it is claimed has advantages not possessed by any

lower edge of the outer end of the axle-box, having on its inner face a boss that, when said lid or cover is closed, serves to receive the end-thrust or end-bearing of the axle; and it consists, further, of a stirrup or shackle [shown by dotted lines in its two positions in fig. 1] pivoted on the sides of the axle box, and designed to be turned down over the closed cover or lid to hold it firmly in a closed position and keep the boss against the thrust of the axle."

By dispensing with the collar, it is claimed that the journal may be made as large as may be desirable, up to the diameter of the wheel-seat. This reduces the cost of the finished axle and increases the life of the journal. The life of the bearing, it is said, is also increased by protecting it from end wear, and there is less liability to heat, because the end bearing has more surface than can be provided if a collar and shoulder alone must resist this wear. The insufficient bearing surface of the brass on the collar and shoulder is always a prolific cause of hot boxes: this evil, it is claimed, is effectually remedied by the arrangement of end-bearing shown above.

Many of these boxes are being manufactured by the Ramapo Wheel & Foundry Company at Ramapo, N. Y.

to transport freights from the grain fields of the far Northwest, two thousand miles from tide-water, and supply the markets of Europe with breadstuffs at a profit to the producer and at a reasonable cost to the consumer. Many changes and improvements have contributed to this result, a part of which can be directly traced to the investigations inaugurated at our annual conventions. The introduction and use of steel for rails, locomotive tires and boilers has effected much toward solving the problem of cheap transportation, and it will be remembered that this subject received our earnest attention in the early days of our organization, and our conclusions have been fully sustained by subsequent events.

Steel rails have enabled us to use large locomotives and heavier and stronger cars, so that car-loads have been doubled in weight and the cost of operating largely reduced, especially in the freight traffic department. Steel tires have also done their part in promoting economy and safety in railway management. It has been practically demonstrated that steel tires properly secured to the wheels of a locomotive are almost absolutely safe; and the few breakages that do occur can generally be traced to faulty workmanship and almost exclusively to excessive shrinkage. The question of the superiority of steel to iron for the tires of driving-wheels for locomotives we may consider as settled, and yet in the infancy of our Association it will be remembered that

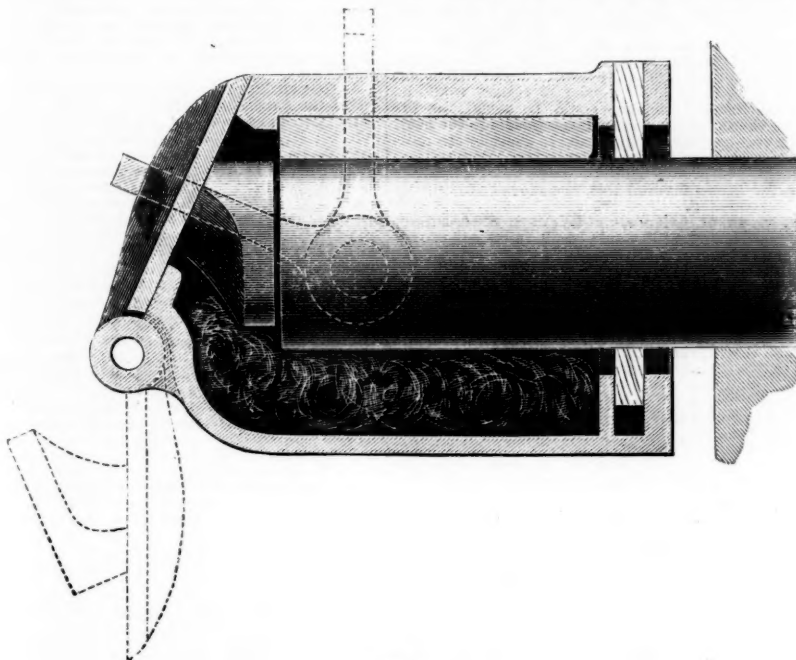


Fig. 1

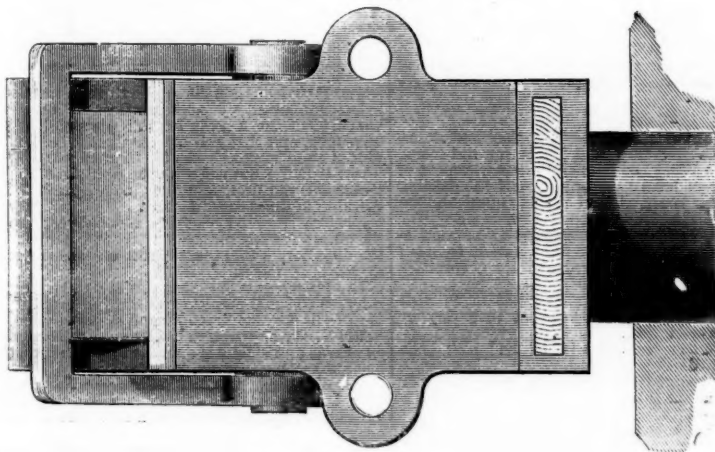


Fig. 2

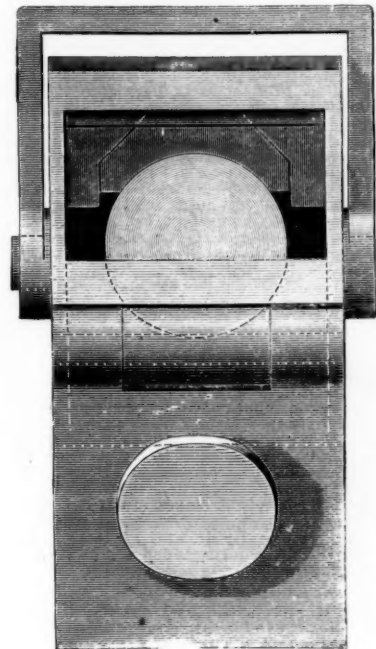


Fig. 3

RAOUL'S JOURNAL BOX.

others. The one illustrated and described in the *Railroad Gazette* in 1878 was extensively used on the Erie Railway, and consisted of a transverse bar which was placed across the end of the axle, and which was held by suitable lugs and recesses cast in the inside of the box. Fig. 145 of the "Car-Builders' Dictionary" represents Wright's stop journal-bearing. In this the journal-bearing has a lug or bracket cast in its outer end so as to project downward over the end of the axle and thus form an end-bearing. Fig. 146 represents Bissel's stop-key journal-bearing. In this the key has a lug or bracket similar to that in Wright's bearing, which also projects downward over the end of the axle.

In all of these the end of the axle is hidden by the end bearing when the box cover is open. This prevents those who have the care of the boxes from seeing the condition of the bearings. The one just referred to must be removed before the box can be satisfactorily packed.

In the box illustrated herewith the end-bearing is attached to the box cover, as shown in fig. 1, which is a longitudinal section. Fig. 2 is a plan and fig. 3 an outside end view with the cover open. In fig. 1 the position of the cover when open is represented by dotted lines. In his specification the inventor says:

"The object of this invention is to provide an axle-box for car-journals of such design and arrangement as to dispense with the use of the wedge or key heretofore used over the journal-brass, and to dispense with the button or collar heretofore used on the ends of the axle to receive the end-thrust; also, to provide the axle-box with a close fitting lid or cover that can be opened and closed easily and quickly."

"The invention consists of a lid or cover hung to the

Either that company or the patentee may be addressed for further information concerning this invention.

THE MASTER MECHANICS' ASSOCIATION. Fourteenth Annual Convention.

The annual meeting of this Association was held this year in Providence, R. I. The opening session was called to order by the President, Mr. J. N. Lauder, at the Franklin Lyceum Hall, on Tuesday, June 14. Prayer was offered by Rev. Augustus Woodbury, after which His Honor, Mayor Hayward, welcomed the members of the Association to Providence by a short address.

ADDRESS BY THE PRESIDENT.

The President of the Association, Mr. James N. Lauder, then delivered the annual address, as follows:
Gentlemen of the American Railway Master Mechanics' Association:

It gives me unequalled pleasure to greet so large a number of members at the opening of this our fourteenth annual convention, and to have your continued interest in our organization signified by your presence. And our experience shows that the time here spent in comparing notes and interchanging views is of real value in indicating the best manner in which to meet the requirements and advance the interests of those whom we serve.

The period during which this Association has been in existence has been one of great importance to the railway interests of the country, and I think we can with fairness claim for this body a good portion of credit for the present prosperity of our general railway system. It is certain that but for the important matters introduced in consequence of suggestions emanating from our own and kindred bodies, the present rate of transportation would be impossible without doing business at a loss; and as a result we are enabled

committees were appointed who gave the matter the fullest investigation in its then undetermined state, and the discussions elicited may be turned to with an interest greatly enhanced by the marked advance of the past few years. The displacement of iron and copper for locomotive boilers, and the introduction of steel, was only effected after the most painstaking investigation and repeated experiment, and manufacturers, awakened by the agitation to its importance, have aided by scientific research until they have succeeded in producing a steel that is universally admitted to be far preferable to any other material for this purpose. As a consequence locomotive boiler explosions are now almost entirely unknown, whereas formerly they were of comparatively frequent occurrence.

Another outgrowth of our inquiries and examinations has been the steady increase of the locomotive engine in size and capacity. At the time of our organization, only thirteen years since, the recognized standard engine had cylinders 16 in. x 24 in., four coupled driving wheels, with a weight of thirty tons, and from this standard has been enlarged until we now have cylinders of 20 in. x 26 in., eight coupled driving wheels, with a weight of fifty tons; and these magnificent machines are now in use in all parts of the country where there are heavy grades to overcome for a large traffic. The rapid and constant improvement in this respect has been so marked that we may confidently expect still further progress in the future, and it will be our mission, as in the past, to assist this development by continued research, and thus add to the welfare of our immense and unparalleled railway system.

The prosperity which now attends us, is a matter for congratulation, and yet we have been taught valuable lessons by the "hard times" which have been experienced during the last decade of years. Perhaps not otherwise would economical measures have received so powerful an impetus and been fostered by such careful and anxious attention. Let us hope that the habits of frugality and thrift

thus established may not be disturbed by the spirit of speculation which is again making itself felt in the business world. A continuance of our discussions, with the same disposition toward mutual assistance which has always characterized them, will encourage and perpetuate the ideas of retrenchment upon which so much of our prosperity depends; and this without regard to the methods by which the various subjects are presented for our consideration. The system inaugurated at our last meeting in Cleveland promises excellent results, and the reports of the committees of research appointed at that time will be presented during our present session. Additional papers have also been prepared by three of our associate members, and from the well-known ability of the authors will undoubtedly add much to the value and interest of our annual report.

During the past year one of our members, Mr. John Swift, of the Schenectady Locomotive Works, has been removed by death. He was a kind friend, a genial companion, and a most valuable member. I trust suitable action will be taken by this body to testify their appreciation of his worth.

Our constitution provides for the holding of our annual convention on the second Tuesday of May, but for good, and as it was thought, sufficient reasons, the Supervisory Committee arranged for its postponement this year until the present time. I trust this action will meet your approval, and I would suggest the propriety of changing the time for the annual meeting if it shall be thought desirable.

For the second time you have honored New England by holding your annual convention within her limits, and as a New Englander I bid you a hearty welcome to our good city of Providence. Although we have representatives here from the icy North, the boundless West and the sunny South, our interests are identical; and allow me to hope that this assemblage upon the beautiful shores of Narragansett Bay, for the comparison of notes and interchange of ideas, may prove both interesting and profitable.

Upon this gathering probably depends the future of our Association; and in view of the much that has been accomplished by it, let us unite in renewed and earnest endeavor to continue on our work so as to insure permanent benefit to every member of our profession, and so shall our Association be not only the pride of its members but shall be honored by every party in whose interests our labors are exerted. And permit me to hope that so pronounced will be the success of our present session that upon its conclusion you may each and every one feel that you have been amply repaid for all the trouble and expense incident to your attendance upon the fourteenth annual convention of the American Railway Master Mechanics' Association.

ANNUAL REPORTS.

The annual report of the Secretary, Mr. J. H. Setchel, of Cincinnati (Little Miami Railroad), was then presented and received. It shows that seventeen members have been added to the Association since the last annual convention, which, with other changes during the year, makes the membership at present 197. The receipts during the year from all causes have been \$1,324.20. The "Boston Fund" has been increased by interest and donations to \$4,069.51.

The report of the Treasurer, S. J. Hayes, of Chicago (Illinois Central Railroad), was also presented and received. Balance on hand at beginning of year, \$641.42; receipts for the year, \$1,324.20; payments during the year, \$1,234.83; balance now on hand, \$730.81.

BUSINESS.

A communication was presented from the Supervisory Committee, giving the reasons for changing the time of the annual meeting from the second Tuesday in May until the present time, the main reason being that the second Tuesday in May was too early for the Western men to conveniently attend. This communication was received and placed on file.

The following committees were appointed:

On Finance—George Richards, Boston (Boston & Providence Railroad); William Woodcock, Elizabethport, N. J. (Central Railroad of New Jersey); James T. Gordon, Concord, N. H. (Concord Railroad).

On Correspondence—John Black, Lima, O. (Dayton & Michigan); S. J. Hayes, Chicago (Illinois Central); J. H. Flynn, Atlanta, Ga. (Western & Atlantic).

BOILER CONSTRUCTION AND IMPROVEMENT.

The Secretary then presented and read the report of Reuben Wells, of Louisville Ky. (Louisville & Nashville), chairman of the Committee of Research in Boiler Construction and Improvement. This report was a consideration of the matter of riveting boilers, and an argument in favor of "set riveting," or what is known as "button-set riveting." He claimed that this mode of riveting is more economical and much superior to riveting done by hand, while the work is equal to that done by steam, and therefore, this is the better way for establishments that do not use steam for this purpose. The report was accompanied by charts, showing the mode of work, the tools required, the work as done, etc., as well as by samples of button-set riveting, hand riveting and steam riveting, and presented statistics taken from actual experience and from tests in support of the benefits of the button-set riveting. The report sums up the matter as follows:

"It seems to me that the plan of set riveting, owing to its cheapness, and the expedition in doing the work, should receive more attention in the way of carefully made tests as to quality of the work done by it, and the cost for labor, than has heretofore been given to it, and it is with the view of calling attention to the plan that this report has been written. Steam riveters drive from 30 to 60 rivets per hour, depending on the machine, the character of the work, and the way it is managed, and the cost for labor of the gang driving the rivets varies accordingly from 1 to 3 cents per rivet. A gang of men driving rivets by the set-riveting plan will average about 26 rivets per hour, taking the whole boiler, at a cost of labor of 2.64 cents per rivet, and to drive them by hand a gang of men will average about 12½ rivets per hour for the whole boiler at a cost for labor of 5.84 cents per rivet."

[This report will be published in full in a future number of the Railroad Gazette.]

The report was received and the subject was thrown open for discussion, the President stating that according to the report button-set riveting is superior to hand riveting. If this is the case, we ought to dispense with hand riveting at once, as it is very expensive.

Mr. R. H. Briggs, of Whistler, Ala. (Mobile & Ohio), said he had made at least twenty tests of the button-set riveting, and every time it had proved stronger than the hand riveting. It is a revolution in boiler making which deserves close attention.

Mr. August Schaffer, of Louisville, Ky. (Louisville, Cincinnati & Lexington), complimented and endorsed the report.

Messrs. Secretary J. H. Setchel, F. M. Wilder, of Susquehanna, Pa. (New York, Lake Erie & Western R. R.); H. L. Leach, Boston; John Black, Lima, O. (Dayton & Michigan); J. S. McCrum, Kansas City, Mo. (Missouri River, Ft. Scott & Gulf), severally spoke in favor of button-set riveting, and the discussion was closed.

A report was next presented from Mr. Jacob Johann, of Springfield, Ill. (Wabash & St. Louis R. R.), of the same

committee. This report was a comparison of the merits of the wagon-top and straight-top types of boilers, expressing a preference for the straight-top type, and giving a description of his mode of constructing, or rather of supporting, the fire-box crown by long stays, a plan which he has found satisfactory. As was the previous one, this report was liberally illustrated with diagrams.

The discussion on this report was temporarily postponed. [This report will also be published in full hereafter.]

EXPERIMENTS WITH THE DYNAMOMETER.

Mr. F. M. Wilder, of Susquehanna, Pa. (New York, Lake Erie & Western), then presented a paper giving the results of experiments in train resistance and with the dynamometer, to ascertain what is done with the power exerted with the engine. This paper was also illustrated with diagrams, and, after a recess to examine these, the paper was received and ordered on file.

GENERAL DISCUSSION.

The time was then taken up for a season of discussion on general topics. Mr. R. H. Briggs, of Alabama, called attention to the confusion that often arises in ordering from a wire gauge, between the Birmingham and American standards, and suggested that the Association adopt a standard gauge.

Mr. Wilder moved a committee be appointed to take this matter into consideration, which motion was carried.

Mr. Secretary Setchel inquired which system of running locomotives was the most economical—the system of running by the day or by the mile. It seemed to him that if a contract system of running locomotives that should compensate the engineer for his care in the use of oil, in the burning of coal, etc., could be adopted, wonderful results would be obtained. He thought millions could be saved for the roads and at the same time give large profits to the men. He would have a committee appointed to consider the matter and report a plan for running locomotives by a contract system.

Mr. Treasurer Hayes favored this, and moved that such a committee be appointed.

Mr. J. H. Flynn, of Atlanta, Ga. (Western & Atlantic), favored the plan, believing it would result in both the roads and the employees making more money.

Mr. J. M. Boon, of Fort Wayne, Ind. (Pittsburgh, Ft. Wayne & Chicago), said his road had found the premium system working to the advantage of the road, but was not satisfactory to the men, by reason of the different classes of engineers. He thought a system, as suggested by Mr. Setchel, where the railroad will fix a basis for running the engine and pay to the engineer a percentage on what is saved beyond that, would be a good system.

Several members spoke in favor of the motion. Mr. Wilder suggested that the committee should first obtain all the information possible upon premium systems previously tried; secondly, should report to the convention whether in their opinion it is desirable to adopt or recommend such a system; thirdly, to report the best system they can possibly devise.

The motion for the appointment of a committee was then carried.

BOILERS AGAIN.

The convention then took up the report of Mr. Johann on boilers and boiler construction, which was discussed by Mr. Secretary Setchel, Mr. Wiggan, of the Hannibal & St. Joseph, Mr. Treasurer Hayes, Mr. President Lauder, J. S. McCrum, of Kansas City, Mo.; J. W. Philbrick, of Waterville, Me. (Maine Central Railroad); Mr. Briggs, of Alabama; August Schaffer, of Kentucky; A. G. Eastman, Richmond, Va. (Southeastern Railroad); and W. Woodcock, New Jersey (Central Railroad of New Jersey). The discussion brought out much of the experience of the members, and also a wide range of views, mainly upon the mode of constructing and staying the crown sheets of the fire-box, and was not only interesting to those present, but must have given much information.

BUSINESS.

The Committee on Finance reported that they had examined the reports of the Secretary and Treasurer and found them correct; also, that they recommend an assessment of \$5 upon each member to defray the expenses of the ensuing year. This report was received and the recommendation adopted.

The Committee on Correspondence reported a communication from Niagara Falls, inviting the Association to meet there next year. Received and referred to the Committee on Place of Meeting.

Also, a communication containing an invitation to visit the works of the Nicholson File Company at such day or hour as will suit the Association.

The President stated that the Association had also been invited to visit the Rhode Island Locomotive Works in a body, and as these two establishments were near together they could be visited at the same time. Action on these invitations was postponed.

The President stated a committee, representing several interests in the city of Providence, had invited the Association to partake of a clam bake at Silver Spring the next day, and that a steamer would be in readiness to carry the members at 2 o'clock. This invitation was accepted.

The Chair announced as Committee on an Application for Associate Membership, Messrs. G. A. Coolidge, of the Fitchburg Railroad; James Eckford, of Cincinnati, Ohio (Cincinnati, Hamilton & Dayton), and George E. Boyden, of Boston (New York & New England).

A communication was received, read and placed on file from the locomotive department of the Great Southern & Western Railway, dated Inchicore, Dublin, containing photograph of an express engine used for mail trains on that line.

An invitation was received from William A. Harris inviting the members of the Association to visit the Harris-Corliss Engine Works as often as their engagements and duties would permit. This invitation was accepted.

At 2 o'clock the Convention adjourned until 9 o'clock the next morning.

After the adjournment, the members of the Association, in response to the invitations received at the meeting, and finding carriages in waiting, visited the Rhode Island Locomotive Works and the Nicholson File Works, and passed an hour or two in looking over these establishments, finding much to interest them in both. The evening was passed at the Narragansett, in exchanging ideas concerning their profession and in general conversation.

SECOND DAY'S PROCEEDINGS.

The second day's session opened in due season, Mr. President Lauder in the chair. The number in attendance was very large, almost completely filling Franklin Lyceum Hall.

The Committee on Application for Associate Membership reported favorably upon the application of Lewis F. Lyne, of the American Machinist, New York, and Mr. Lyne was unanimously elected associate member.

COMBUSTION OF COAL.

The report of James M. Boon, of Fort Wayne, Ind., chairman of the committee to investigate the best means of pro-

ducing better combustion in the use of bituminous coal as fuel for locomotives, was presented, read and received. The report considered the whole matter of the best means of burning bituminous coal in locomotives, of different qualities of coal in grates of different makes and sizes, and gave the results of different experiments, and was illustrated with diagrams. It recommends further experiments in this country in order to devise a baffle plate of such shape and composition that will resist the action of the fire long enough to make it pay to use it, and speaks highly of the use of the high exhaust nozzle instead of the low, experiments having shown that it is more economical in the use of coal. The report concludes as follows:

"The conclusion the committee have arrived at, after investigating the subject, is that no general rule can be given for producing better results in the combustion of bituminous coal, but that each coal must be treated separately for its special chemical composition. This also applies to the size of the coal, some of which will give good results with large pieces, others with small pieces. The size reported to answer best for most coals is that which will pass through a ring 3½ in. diameter. The mechanical appliances for producing combustion will necessarily be varied for the different qualities of coal, and it will be seen that five different styles of grates are in use on as many different roads; each no doubt doing good results in its own locality. When it is possible to bank fires and avoid clearing the furnace at the end of each trip, a very great economy of fuel is obtained. For economical coal-burning, two things of vital importance are necessary. First, a large fire-box and plenty of heating surface; second, care and intelligence on the part of the fireman."

At the conclusion of the reading of the report, it was put before the Association for discussion, which was participated in by Mr. Henry Elliot, of St. Louis, Mo.; Mr. Secretary Setchel; Mr. Boon; J. W. Philbrick, of Waterville, Me.; John Black, of Lima, Ohio; Mr. President Lauder; Mr. W. O. Hewitt, of Peoria, Ill.; Mr. Treasurer Hayes; W. Woodcock; A. August Schaffer, of Louisville, Ky.; A. G. Eastman, of Richmond, Va., the discussion in the main being upon the question as to which is the better, the high or low exhaust nozzle; as to whether the best results can be obtained with a large or a small fire-box; as to whether different nozzles should not be used in different seasons of the year, the several members giving the results of their experience.

FORM OF LOCOMOTIVES.

The report of Mr. W. Woodcock, of the Central Railroad of New Jersey, chairman of the committee on the best form of construction of locomotives for fast passenger service, was then presented, read and received. The committee based their inquiry on a speed of fifty miles an hour, and considered the question as to which was the best form of locomotive for this speed—the American, or eight-wheel engine, or the locomotive having one pair of driving wheels and a four-wheel truck. The committee presented the views of various railroad master mechanics upon this subject, as well as the result of experiments with different engines, and arrived at the opinion that for express passenger service, under all circumstances, the American or eight-wheel engine is the best to meet the want required on American railroads, the dimensions to be worked out to suit the service, grades and conditions required on the several roads.

The discussion on this report was postponed temporarily and a recess of ten minutes taken.

SUBJECTS FOR THE NEXT MEETING.

At the conclusion of the recess the time was given to the discussion of special subjects.

Mr. August Schaffer, of Louisville, Ky., thought there was some difficulty in the counterbalance of engines, and suggested that a committee should be appointed to consider the matter of the counterbalance, also the merits of injectors, and devise some means by which they can be ascertained.

The President thought to have any particular make of injector indorsed by a committee, or by the Association, would place the Association in a position it did not wish to be placed, and that this matter should be left to the individual members to choose for themselves.

Mr. Schaffer did not wish the committee to say which injector was the best, but they could present results of the working of different injectors.

Mr. Treasurer Hayes said a test between the injectors and the pumps for one month was about 7 per cent. in favor of the injector, while the repairs on the injector are very slight.

The President stated that subjects to be treated should be referred to the Committee on Subjects, and if that committee sees fit they will recommend a report upon that subject.

Mr. N. W. Howson, of Mt. Sage, Mo., thought a committee on sparks and smoke should be appointed, as this is an important matter, especially on his road.

Mr. Woodcock, Central Railroad of New Jersey, suggested as a subject, "What is the best lagging or covering for locomotive boilers, and the best manner of applying the same."

Mr. Secretary Setchel said as far as his experience went, and he had known of asbestos, etc., being tried for covering bridges, he had found nothing better than wood.

Mr. J. M. Flynn, of Atlanta, Ga., said wood was the best that he had found, although experiments are now being made with a covering of kaolin, which is pronounced so far excellent.

Mr. G. A. Coolidge, of Charlestown, Mass. (Fitchburg Railroad), said they were using a preparation of asbestos. The best, he thought, was what was known as "Salamander," composed of asbestos, with a little lime, a little plaster of Paris, etc. He would recommend trying some of the preparations, those having the greater proportion of asbestos being preferable.

The Committee on Subjects reported the following subjects for the next meeting, which were referred as stated:

To the Committee on Research—"Improvement in boiler construction."

To the Committee on Investigation—"The best material and form of construction for parallel rods of locomotives to prevent their breaking;" "New plans of construction and improvement of locomotive engines;" "The most practicable and best system of paying premiums to locomotive engineers and firemen, to induce economy in working locomotives."

The report was received and the subjects as set forth therein adopted.

GENERAL BUSINESS.

The discussion on the report on the best form of construction of locomotives for fast passenger service was postponed until the next day, and made the special order for 9 o'clock in the morning.

The President appointed as committee on the next place of meeting Messrs. August Schaffer, of Louisville, Ky., Charles H. Cory, Portsmouth, O.; J. H. Flynn, Atlanta, Ga.

Also the following Committee on Resolutions: Messrs. J. W. Philbrick, Waterville, Me.; J. F. Devine, of Wilming-ton, N. C., and R. H. Briggs, of Whistler, Ala.

SHOP TOOLS AND MACHINERY.

The report of H. W. Sprague, of Pittsburgh, Pa. (H. K.

Porter & Co.), Chairman of the Committee on Shop Tools and Machinery for the Manufacture of Locomotives, was then presented and received. This report considered the questions of using milling machines, of making and threading bolts, set-screw and studs; of the use of grindstones, emery wheels or belts, for finishing work; of the use of dies and formers in the smith's shop; and of new and improved machinery and special tools not in general use that economize work.

Owing to the small number of replies received to the circular sent out by the committee, the committee recommend that the subject be continued, "confident that great improvements can and will be made, and that it is our interest as well as duty to encourage and help them in the interest of economy in our departments, and also in the interest of mechanical advancement."

The convention then adjourned until the next morning at 9 o'clock, to enable the members to take a trip to Silver Spring, according to invitation.

Three new members of the Association were received during the day.

THIRD DAY'S PROCEEDINGS.

The third session began at 9 o'clock, Mr. President Lauder in the chair.

FORM OF CONSTRUCTION.

The report presented Wednesday on the "Best Form of Construction of Locomotives for Fast Passenger Trains," was taken up for discussion, which discussion was participated in by Mr. G. A. Coolidge, of Charlestown, Mass. (Fitchburg Railroad), who thought there might be an element of safety in what may be called the new type of engines for this service—the engine with the single pair of driving wheels; by Mr. President Lauder, who thought the American engine, so-called, the eight-wheel engine, was the proper engine for passenger service, and that with the proper construction of the parallel rods, safety could be acquired; by Mr. R. H. Briggs, of Whistler, Ala., who said he had seen no case of breakage of parallel rods except from faulty construction—from taxing them more than they could bear—and who thought there was an extremely thick veil over the single driver engine, of which so much was expected; and by Mr. M. N. Forney, of New York, who thought there would be a radical departure in the construction of engines for this service before a great while, and that the future passenger engine would be one of six driving wheels, with radical changes in the fire-box, etc.

THE QUALITY OF STEAM.

A paper on "The Quality of Steam," prepared by Mr. John W. Hill, of Cincinnati, an associate member, was read by the Secretary. The paper gave the results of several experiments with the continuous calorimeter to determine the quality of steam under different circumstances, and in different boilers, and was of such a character, being full of figures, that it is of value to persons interested in this matter, and of value to them only as they can examine it carefully, compare the one experiment with the other, etc. The paper was received, and the thanks of the Association tendered to Mr. Hill for the very able manner in which he has treated the subject.

AXLE BOXES.

Mr. M. N. Forney, of the *Railroad Gazette*, from the committee appointed to confer with a similar committee of the Master Car-Builders' Association, to consider the subject of a standard car journal-bearing box and pedestal, and report whether any change is desirable from the standard already recommended by that Association, presented the report of that committee. The committee are of the opinion that no alterations in the standard should be made which would prevent new parts from interchanging with the old, or vice versa. Some defects in the bearing, box and pedestal, however, have been pointed out to the committee which can easily be remedied without interfering with the interchangeability of these parts, and lithographs of these changes were presented to the Association. The committee recommend the passage of the following resolution, which Mr. Forney stated was passed, with a slight amendment, at the meeting of the Car-Builders' Association in New York the day before:

"Resolved, That the drawings of the car journal-bearing, journal-box and pedestal, of which copies are submitted herewith, be declared to represent the standard form and proportion for these parts, and that the same be recommended by this Association for general use on cars and locomotive tenders."

This report was received, and the resolution recommended and adopted.

This report and engravings of the drawings submitted with it will be published hereafter.

SUBJECTS FOR NEXT MEETING.

The report of the joint committee to recommend committees to report upon the various subjects assigned for the next meeting, was presented as follows—the chairman of the committees, with the exception of the first, having the power to select the remainder of their committees to suit themselves:

On improvement in boiler construction.—Reuben Wells, Louisville, Ky.; S. J. Hayes, Chicago, Ill.; C. R. Peddle, Terre Haute, Ind.; Jacob Johann, Springfield, Ill.; James Eckford, Cincinnati, O.

On the best material and form of construction for parallel rods of locomotives to prevent their breaking.—Howard Fry, Williamsport, Pa. (Philadelphia & Erie), chairman.

On new plans of construction and improvement of locomotive engines.—W. Woodcock, Elizabethport, N. J., chairman.

On the most practicable and best system of paying premiums to locomotive engineers and firemen to induce economy in working locomotives.—F. M. Wilder, Susquehanna, Pa., chairman.

To investigate and recommend a suitable standard wire gauge for adoption.—R. H. Briggs, Whistler, Ala., chairman.

On smoke stacks and spark arresters.—James Sedgley, Cleveland, Ohio, chairman.

This report was received and adopted.

CLEARANCE AND COMPRESSION.

A paper prepared by Mr. Charles A. Smith, of Washington University, St. Louis, Mo., upon clearance and compression, was read by the Secretary, and received. The paper concludes as follows: "It seems as if scarcely any improvement was possible in the modern locomotive, and all claims of large savings are utterly absurd, as of heating fuel and giving oxygen to the fuel by some chemical process; but if the clearance space can, by the use of a long cylinder with deep counterbores and sunk heads, with the port openings over those in the cylinder, and with two exhaust ports and valve in two portions (if not in two pieces), be reduced from 8 per cent. to 5 per cent., we have the certainty of an economy of 3 per cent., which may be expected for all cases when the engine has hard work to do."

PRECAUTIONS AGAINST SCALDING ACCIDENTS.

Mr. M. N. Forney, of the *Railroad Gazette*, New York, said he believed the reading before the Association of such papers as cannot be understood by hearing them read—as those full of statistics and figures of comparison—is a useless formality. With this view he would place in the hands of

the officers of the Society a paper which he had prepared for the Association, which he would not read. The paper is entitled "Attachments to Locomotive Boilers," and calls attention to that class of accidents in which people are injured by scalding, and suggesting some remedies. This paper was received and referred to the Advisory Committee, with power to incorporate it in the annual report of the Association.

[This paper was published in full in the *Railroad Gazette* last week.]

MATTERS OF BUSINESS.

Mr. J. H. Raymond, of Chicago, moved that the attention of the Supervisory Committee be called to the clause of the constitution requiring the reports of the committees on the various subjects to be printed and supplied to the members at the commencement of each annual convention, and that this committee be instructed to carry it into effect next year as far as possible. This motion was carried.

The following were unanimously elected associate members in accordance with the recommendation of the committee on that subject: F. W. Dean, tutor in the Lawrence Scientific School, Cambridge, Mass.; William Kent, of Schoenberger & Co., Pittsburgh, Pa.; Alexander Gordon, General Manager Niles Tool Works, Hamilton, Ohio.

An invitation was received from George H. Corliss to the members to visit the Corliss Steam Engine Works to witness the working of the large sewer pump, from half-past 2 until 4 o'clock that afternoon.

Also an invitation to such of the members as visit Boston to visit and inspect the Hancock Inspirator Works.

ELECTION OF OFFICERS.

Officers were elected for the following year as follows: President—J. N. Lauder, Concord, N. H. Vice-Presidents—Reuben Wells, Louisville, Ky.; James Sedgley, Cleveland, O.

Secretary—J. H. Setchel, Cincinnati, O. Treasurer—S. J. Hayes, Chicago, Ill.

Mr. President Lauder thanked the Association for the honor of re-electing him to this office, and announced his intention of performing the duties of the office the coming year to the best of his ability. If he had made errors the past year he hoped the Association would excuse them.

Mr. J. H. Flynn, of Atlanta, Ga., was elected a member of the Standing Committee on Subjects for three years.

BUSINESS MATTERS.

The compensation to the Secretary for services was fixed the same as last year—\$600.

The Committee on Place of Meeting recommended Niagara Falls, Pittsburgh, Pa., and Louisville, Ky., as places from which to select the place of the next annual convention, and Niagara Falls was selected, and the time was fixed, by constitutional amendment, on the third Tuesday of June.

A committee, consisting of Messrs. F. M. Wilder, Susquehanna, Pa.; James Sedgley, Cleveland, O.; and W. Woodcock, Elizabethport, N. J., was appointed to confer with a similar committee from the Master Car-Builders' Association, to consider the subject of having the annual conventions of the two associations at the same time and place, and the President was authorized to telegraph this action to the Master Car-Builders' Association now in session in New York.

A communication was received from the *Railway Review* of Chicago, and the *Railroad Gazette* of New York, offering to print the reports on the various subjects previous to the annual convention, and supply the convention with copies, free of expense to the Association, under certain conditions. This offer was accepted, and the thanks of the Association were tendered to the publishers of the papers.

The Committee on Resolutions submitted the usual resolution of thanks for favors received at the convention, which was unanimously adopted.

Messrs. Setchel, Eckford and J. S. Patterson, of Cincinnati, O., were appointed a committee to prepare suitable resolutions upon the death of John Swift, and Messrs. J. C. Ellis, of Schenectady, N. Y. (Schenectady Locomotive Works), Sedgley and Wilder, to prepare resolutions on the death of B. F. Gregg.

The Committee on Finance reported having received \$305 during the session.

At 1:25 o'clock the convention adjourned, to meet at Niagara Falls on the third Tuesday of June, 1882.

Bursting a Steam Boiler—D. T. Lawson's Theory of Explosions.

An interesting account of the success of D. T. Lawson of Wellsville, Ohio, in bursting a steam boiler, intentionally, was printed in the *Pittsburgh, Pa., Commercial* of Friday last. On the 23d of January last, when Mr. Lawson was in this city, the *New York Evening Post* published a long report of an interview with him, in which he explained his novel theory of the cause of boiler explosions. The experiment in question was made to illustrate this theory, which was thus described in its report:

"Mr. Lawson then asserted that the only explosive element in a steam boiler was superheated water, steam not being explosive at all, but only expansive. Superheated water he explained to be water which was heated by special means to a higher degree than the boiling point under the ordinary pressure of the atmosphere. When superheated, he declared, water was exploded by a sudden reduction of the pressure on its surface—bursting into steam, which instantly filled 1,700 times the space which the water had occupied. Hence, when a large quantity of superheated water exploded in a boiler the force was terrific."

"When the water is thus superheated, Mr. Lawson says, the engineer opens the cylinder port, and the steam instantly fills the cylinder, creating a vacuum to that extent over the superheated water, a part of which bursts into steam. This strikes every square inch of the boiler with a concussive force vastly greater than the regular steam pressure. The large proportion of explosions which occur just as steam is turned into the cylinder at starting, and before its passage from the boiler has become uniform, is explained in this manner. Another common cause of explosions is the sudden condensation of steam over the superheated water in the boiler, thereby instantly creating a vacuum and consequent removal of pressure, whereupon the water bursts into steam with tremendous concussive force. The many explosions attributed to cold water striking hot iron are really caused by cold water striking hot steam, causing condensation and removal of pressure."

In the same report the following paragraph occurred: "Referring to the national commission appointed in 1871 to investigate steam boiler explosion, Mr. Lawson said that it had never made any report, as he was informed by the Supervising Inspector General of Steam Vessels. Its members, it was reported, acting upon the low-water theory of explosions, had made every effort to burst a boiler, but had not succeeded. According to newspaper reports, they had collapsed a boiler flue at Pittsburgh under enormous pressure, and had damaged a few other boilers in their weakest parts, but nothing like an explosion had been accomplished. It was alleged that in their experiments at Sandy Hook they not only boiled one boiler dry and then pumped cold water

into it, but allowed the bottom plates to get red-hot before starting the pumps."

Mr. Lawson then described a device which he had perfected for so constructing boilers as to prevent all danger of explosion, according to his theory.

The following is an extract from the *Pittsburgh Commercial's* account of the experiment, which was made at Munnhall Farm, June 16.

"Mr. Lawson exploded his boiler yesterday through the medium of a vacuum created by turning a full head of steam into the cylinder at once. The boiler itself was made of the very best material, and built especially for the experiment in the strongest manner known. It was 6 ft. in length, with a diameter of 30 in. The iron was made by Singer & Nimick, the boiler itself by W. W. Roberts, and the fittings by Wilson, Snyder & Co., the latter firm also furnishing the engineers for the test. Just about five o'clock, everything was ready for the explosion. At that time the boiler was three-fourths full of water, being seven or eight inches above the fire line, and the steam gauge showed a pressure of 380 lbs. to the square inch, the tensile strength of the boiler being 604 lbs. to the square inch. Everything being in readiness, the spectators safely ensconced in the bomb-proofs erected by the government, the valve was pulled and a full head of steam turned into the cylinder. Instantly there was a terrific explosion. The ground trembled as if from an earthquake shock, and in a moment there could be heard a rattle on the bombs. Mr. Lawson and one or two others waited only a few moments, and stepped out just in time to catch a shower of dirt and grime. Scarcely a vestige of the boiler and furnace was left. It was found that the boiler had been completely demolished. It had not given away merely in one point but had been torn into fragments with a force that must have been tremendous. One fragment fell about half a mile away, striking near a machine shop. Another large piece passed over a steep hill, going clear over it, and could not be found. Two large pieces of the middle sheets, a foot and a half wide, and having one end of the boiler attached to them, struck the hill side, bounded several feet into the air, knocked two or three stumps loose, and then, bounding again into the air, struck a large hickory tree fifty feet from the ground, tearing the bark clean, and fell some feet further on. Fragments of the boiler not more than a foot long and four or five inches wide were found in different places. The fragments all showed that the iron was of an extraordinary good quality, and the force that rended it was of tremendous power."

[A full and more intelligible report of this experiment will have very great interest to engineers. It is not plain, however, what Mr. Lawson means by "superheated water." If he means water heated to the temperature due to the pressure under which it is boiled, it is not properly superheated. If he means that water in a boiler becomes heated to a temperature higher than that due to the steam pressure on it, then we feel disposed to ask for the evidence that such a phenomenon ordinarily occurs in steam boilers.

The percussive or concussive theory of steam boiler explosions was suggested by D. K. Clark and Zerah Colburn twenty or twenty-five years ago; but if, as the above report indicates, Mr. Lawson has actually exploded a boiler by allowing the steam to escape from it suddenly, he is the first person to prove the correctness of Clark and Colburn's theory experimentally.—EDITOR RAILROAD GAZETTE.]

THE SCRAP HEAP.

Accidents from Color Blindness.

Supervising Inspector General of Steamboats Dumont is reported as saying in Washington that "every day developments additional proof that it is necessary that pilots of steam vessels and engineers on railroads should be examined for color blindness. The latest case is that of the pilot of the *City of Austin*, who through mistaking the colors of the buoys in the channel lost the vessel in the harbor of Fernandina, Fla., on April 24 last. No lives were lost, but the estimated loss on the vessel and cargo is \$200,000." The pilot was licensed by the state of Florida, and an examination after the accident showed that at the distance of six feet he could not distinguish one color from another. The physicians attributed the pilot's defective vision to the excessive use of tobacco. General Dumont thinks that if the local authorities had availed themselves of the Treasury circular of June 11, 1879, tendering the services of the Marine Hospital surgeons as examiners without fee, this accident would probably have been avoided.

An Improved Railway Station.

An encouraging sign of the time is the interest which has been manifested of late by our railroad officials in the appearance of the stations on their lines. Many of these buildings and surroundings, which were formerly eye-sores, have been so beautified by the judicious expenditure of some thought and a little money, that they now lend an added charm to the landscape, and were they to be removed, they would be missed with regret.

I had occasion lately to visit one of these recently improved stations. The natural surface of the ground rose rapidly in the rear of the building, and along the edge of the great rock mass, cut through just here by the railroad, gurgled a small, tumbling rill across the road, under a board or two. Except just above the station, where everything had been thoroughly cleared away, bits of rock abounded, and these had been utilized in a picturesque manner. Immediately around the station ran a carriage-road, with a convenient oval circuit for turning. On one end of this circuit, near the station, was a weeping beech, and the other extremity was occupied by a group of flowering shrubs, that, although too freshly planted to blossom that year, already impressed the eye as an attractive mass of bright green foliage. Here and there, near the house, were planted pleasant shade-trees, such as the linden, oak and maple. It should be remembered that by thus planting large shade-trees the architectural effect of the building was greatly enhanced, because the side toward the railroad, which is the true front, was uninterfered with. Passing mention is made of this, because objection might otherwise be fairly raised to shutting in the building with trees. The entire work had been completed rapidly, but with evident thoroughness. Rich, well-tilled soil had been secured, and the paths were solid and properly constructed. All the edges of the walks were bordered by cut sods, and the remaining ground was sowed with grass-seed that, by the good luck that sometimes accompanies good management, had come up evenly. A single path wound through the small domain, carried hither and thither so as to obtain the best views of the river near by, as well as the utmost variety of surface. It was surprising how large the place seemed, as one rambled over this undulating path. The matter-of-fact visitor was even betrayed into the expression that it was as good in its way as anything in Central Park.—*Scribner's Magazine* for July.



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S. WRIGHT DUNNING AND M. N. FORNEY.

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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

THE CONVENTIONS THIS YEAR.

The annual conventions of the Society of Civil Engineers, the Master Mechanics' and the Master Car-Builders' Associations were all held this year at the same time. As there are readers of the *Railroad Gazette* interested in each, and some in all, of these meetings, it is desirable to give a report of the proceedings of all of them. Three conventions in one week, however, produces more or less congestion of our columns, and several numbers of the *Railroad Gazette* could be filled with the reports which were read and the discussions thereon at the different meetings referred to.

The meetings of the Master Mechanics' and Master Car-Builders' Associations did not differ very much from those held heretofore. The attendance was about the same as usual, and the reports of committees were of the ordinary character, although it must be admitted that they were generally of rather less interest than heretofore.

The meeting of the Society of Civil Engineers was characterized by the usual lunch-eating and nomadic conviviality. Some papers of interest and value were read, but, as happens on most occasions of this kind, they were disposed of as quickly as practicable and discussion was meagre and of little profit.

To one who attends many of these meetings the opinion gradually grows on him that a great deal of time is unnecessarily wasted in the conduct of their proceedings. This is true no doubt of all deliberative bodies, and is inseparable from them; but it is worth while to consider whether at such meetings it would not be possible to eliminate some of the features which so often make them tedious, and which prevent them from fulfilling their purpose. If we ask what that is, we are answered, usually, by the preambles to the constitutions of the different associations. As a matter of

fact, some parts of the proceedings have much interest to those who attend them, while others are generally regarded as inevitable ills which must be endured with the best grace possible. Among the latter is the reading of long papers which from their very nature it is impossible for an audience to understand. About a third of the last day's session of the Master Mechanics' Association was absolutely wasted by listening to a long paper which not a person in the audience could comprehend by merely hearing it read. The paper may have had great value, but it was of such a character as to be entirely unsuited for reading at a meeting of this kind. Members yawned, some left the room and others sat patiently through the dumb show and looked as wise as they could. No Voudou ceremony could be more absurd than this. Secretly, every man present felt it was an intolerable bore, and doubtless if the thoughts of some of them had been expressed the language would not have been proper to print. Notwithstanding the absurdity and the tiresomeness of this kind of thing, there is hardly ever a meeting of a technical association that it is not repeated one or more times. As stated, such papers may have a great deal of value, but their defect is that they are not adapted for reading to, or rather for understanding by, such an audience as is expected to listen to them. It is singular how many persons there are—otherwise intelligent ones too—who have no sense of the relation of what they utter to the appreciation to those that hear it. The class referred to does not include those who are afflicted with intellectual flatulency or mental strabismus, of whom there are a large number, but only those who, when they write, are incapable of putting themselves in the places of those who must hear what they have written when it is read. It was Boucicault, we believe, who said that all the humor in a play must be very broad, otherwise an average audience would not appreciate it. The same thing is true of a scientific paper. Its subject must be treated very plainly, and should, as much as possible, be reduced to an elementary form. The average capacity of fifty members of any engineering society in this country for sustained mental analysis is very limited, and is not aided much if a paper which they hear is liberally seasoned with mathematical symbols and formulae. In fact there are very few people, no matter how well trained by education, who will give their attention to the reading of an abstruse paper so as to understand it unless they have some strong motive for doing so.

What seems to be needed, and does exist in some societies, is a committee to whom all papers and reports are first submitted for approval, before being read at a meeting of the members. Such a committee must have power to return papers to their authors for revision and amendment.

The Master Mechanic's Association has this year made arrangements to have all its papers and reports printed next year, before the annual meeting is held, copies to be distributed when the papers are read. Possibly this will open the door to dispensing with the reading of those which are inordinately long, stupid or abstruse—an end devoutly to be wished.

If the members of any one of our associations named were asked what part of the proceedings is of the most interest and value, nine out of ten of them would probably say the discussions of the subjects which are brought up by the reports, papers, etc. Quite curiously, very little effort seems to be made to call out discussion. Instead of being neglected, discussion should be the chief end.

There is a tendency, too, in the routine business of meetings of this kind to consume much of the time which could be employed more profitably. If this is not stoutly resisted, the net result of assembling together is liable to consist of getting ready to hold a meeting and then adjourning. The objects for which each one of the associations referred to has been organized are certainly important enough to occupy all the attention that can be given to them, and their proper consideration will consume as much time as it is possible to devote to discussion. It would seem then that the course which should be pursued is, first, to confine routine business within as narrow limits as possible and have it transacted by referring it to committees. Second, have only such reports and papers read as can be listened to profitably by the hearers, remembering always that the attention of an audience is a limited quantity, which is quickly consumed, and not easily recuperated. Third, the principal aim of the meetings should be to encourage and elicit intelligent discussion of the topics which they are organized to consider.

Great complaint is made in some quarters that too much time is devoted during the period of these annual assemblies to conviviality. There is ground for this, although current reports have exaggerated the evil

very much. If some distinct divisions were made between the time to be devoted to the transaction of business and to social enjoyment, it would help to prevent the latter from encroaching on the former. If two or three days were devoted entirely to the business of the meeting, and all lunches, dinners, excursions, etc., were relegated to the third, fourth or fifth days, it would draw a sharp line between the two, and those who like intellectual food most could select the proper days for that kind of feast, while those who hanker after the flesh-pots and wine-bottles need not bother about the theory or the practice of engineering, and some who seek nourishment for both body and mind could have both.

Some important action was proposed at the Car-Builders' meeting this year, which, if carried out, will have an important bearing on the general status of that association, and will affect, somewhat, the theory on which it is constituted. It is well known that railroad companies are not directly represented in either the Car-Builders' or the Master Mechanics' Association. They are simply organizations of individuals holding the positions designated by the titles of those associations. In one sense they may be called clubs of car-builders and master mechanics. It has seemed to some members for a long time that the implied purpose of these associations would be effected much better if railroad companies could be directly represented in the deliberations of those meetings. With this end in view, a constitutional amendment was proposed at the late meeting, and was given in our report of it published last week, and is as follows, which is a substitute for the present sections I., II. and III. of Article III.:

"Sec. I. There shall be three classes of members, Active, Representative and Associate members.

"Sec. II. Any person holding the position of Superintendent of the Car Department, Master Car-Builder, or foreman of a railroad car shop, or one representative from each car manufacturing company may become an Active Member by signing the constitution, or authorizing the President or Secretary to sign for him, and paying his dues for one year.

"Sec. III. Any person having a practical knowledge of car construction may become a Representative Member by receiving a written appointment from the President, General Manager or General Superintendent of any railroad company to represent its interests in the Association. Such member shall have all the privileges of active members, and in addition thereto, on all measures pertaining to the adoption of standards for car construction, or the expenditure of money, he shall have one more vote for each thousand cars owned by the railroad company which he represents. In the enumeration of four, six or twelve-wheeled cars, four axles to count as one car. The dues of Representative Members shall be in proportion to the whole number of votes they are entitled to cast. Their membership shall cease if their appointment expires or is revoked by any officer authorized to make it, or when such a member leaves the employ of the company by which he was appointed."

This met with vigorous opposition and support, and showed a very decided difference of opinion among the members. It was finally referred to a special committee of five members, who are to report on it next year. No doubt it will be very fully discussed and considered during that time. It was probably wise, too, to lay so important a measure over for that length of time, so that it can be viewed from all points. The effect of the adoption of the amendment will be to give all railroad companies the right and opportunity to be represented in the Association in proportion to the amount of their equipment. It is, of course, impossible to anticipate to what extent they would avail themselves of that privilege. If no considerable proportion of them should do so, the Association would remain as it is now. If on the other hand a majority of them, or even less, should appoint representative members, the organization would become a sort of executive bureau for the railroad companies in matters pertaining to car construction. That its influence and revenue would thus be much increased there can be little doubt. Any one who has observed the rapid increase of the mutual interests which railroad companies have in the construction of cars, growing out of the interchange of traffic, must see that some organization to discuss and adjust these interests will inevitably be found. If the Car-Builders' Association does not do it, some other organization will be found that will. At the meeting which was held to discuss the rules for the interchange of cars, the following resolution was adopted:

"Resolved, That in voting upon the adoption of rules to govern the condition of and repair to freight cars offered for interchange of traffic, including payment for cars, in cases of their destruction, the vote of each railroad is to be governed by the number of freight cars the road owns, two four-wheeled cars to represent one car; and that each one thousand cars, or the major part thereof, is entitled to one vote, and it shall require two-thirds of all the votes present to approve."

This places the representation at those meetings substantially on the same basis as that proposed in the substitute for Article III.

Doubtless the whole subject will be fully considered during the next year. If the measure is a wise one, such consideration will strengthen it; if not, its unwisdom will probably become apparent.

THE EAST-BOUND RATE WAR.

Rates on grain and flour from Chicago to New York fell on Friday of last week to 15 cents per 100 lbs., and there are reports, which likely enough are true, that contracts have been made as low as 13 cents. The meeting of trunk-line presidents, held that day and the day before, virtually did nothing except to pass the resolution we publish elsewhere, which was telegraphed all over the country, and curiously by many seems to have been understood as an announcement that all difficulties had been settled; while actually it does nothing except to express regret that rates are low, and to promise not to become parties to time contracts. The latter is certainly important; because with contracts made for periods of a year, as was done in 1876 generally and to a considerable extent since, it would be very difficult to restore rates within that year. But for the present things are nearly as bad as they can be. A few times, but only a few times, have east-bound rates ever been lower, and that when expenses were materially less than now. The vast east-bound traffic, which was entirely satisfactory in amount before rates were reduced, is being carried wholly without profit, very seriously diminishing the income of many railroads, including several which cannot pay dividends and some probably which cannot pay interest on their bonds without the profits of this traffic. That is, should the present east-bound rates be continued for a year or two, some of the railroads would become bankrupt and others which now pay dividends would have to pass or materially reduce them.

Even after all the discussion of the subject of late years, the vastness of this traffic and the significance of an increase or reduction of the rates on it are not generally understood. In 1880 the railroads carrying it, being lines east of the Mississippi but not west of Lake Michigan, earned about \$63,000,000 from it—an average of about \$1,200,000 a week. The average rates were higher than this year. But the traffic is larger this year. The present weekly shipments from all points through to the East average more than 200,000 tons. With the 30-cent rate on grain the gross earnings from this freight could not have been less than \$1,000,000 weekly, or an average of \$5 per ton (the shipments being for various distances, some greater but most less than that from Chicago to New York). The reduction already made takes away nearly one-half (just one-half from grain, but less from provisions), and the loss by so cutting down the rates is probably more than \$400,000 weekly, or at the rate of \$20,000,000 a year—all, be it remembered, a reduction in net as well as in gross earnings to that amount.

It is distributed, to be sure, among a large number of railroads, and some of them have so much other traffic that their share of the loss will not be a serious matter to them. But several of them not only depend very largely on this traffic for their earnings, but are so situated that the rates on a very large part of their local traffic have to be reduced when so great a reduction is made in their through rates. Such roads as the Canada Southern, the Great Western, the Cleveland, Columbus, Cincinnati & Indianapolis, the Indiana, Bloomington & Western, the lines of the Wabash east of the Mississippi, and some others, must suffer great and serious losses from these rates; while the trunk lines and their chief western connections, such as the Michigan Central, the Lake Shore, the Fort Wayne and the Pittsburgh, Cincinnati & St. Louis lose still larger amounts, though perhaps a smaller proportion of their total earnings, because they have so much other traffic. There can be no doubt whatever that the continuance of the present rates means disaster and a tremendous destruction of the value of railroad property to its owners. We have tried them and proved so much. Heretofore we have shown that the whole of the vast increase of profits of several roads, such as the Michigan Central, made in 1880 over 1879, was due to the higher through east-bound rates of 1880, and two or three of the roads have afforded the figures which enable us to prove just how much was gained by the advance in these rates. There is no doubt that the effect was similar on all the trunk lines and the other large carriers of through east-bound freight, though for lack of reports of this traffic separately we are not able to say just how much was gained on each in this way. Let us cite some instances:

The Michigan Central in 1880 carried less east-bound through freight than in 1879, but owing to an increase from 0.515 to 0.719 cent per ton per mile on this freight, its earnings from this traffic were \$728,838 more in 1880. Now the entire increase in its net earnings from 1879 to 1880 was only \$565,422, so that but for the higher rates on this particular traffic it would have had

smaller profits in 1880, instead of the larger ones which enabled it to pay 8 per cent. dividends.

The Lake Shore does not report its through east-bound freight separately from the local, and its whole east-bound freight was slightly less in 1880 than in 1879, but the average rate on it having increased from 0.597 to 0.747 cent, its earnings from this part of its traffic increased no less than \$1,668,383, which is five-sixths of its whole increase of net earnings that year, a fifth of the total net earnings, and equal to 3¼ per cent. on the company's capital stock.

The Cleveland, Columbus, Cincinnati & Indianapolis had less through freight east in 1880 than in 1879, but owing to an increase of 0.519 to 0.663 cent per ton per mile in the average rate at which it was carried, the earnings from this freight were \$340,000 larger, while its total increase in net earnings was \$380,000. This was one-fourth of the total net earnings in 1880, and equal to 2¼ per cent. on the company's capital stock.

The Pennsylvania Railroad does not report the traffic in different directions, nor through and local separately, in the report that has thus far appeared. But of the increase of \$5,282,000 in total freight earnings made on its lines east of Pittsburgh and Erie in 1880, no less than \$3,350,000 was due to the higher average rate. Certainly by far the greater part, and very likely the whole of the increase in the average rate was due to the higher east-bound rates. Now the entire increase in net earnings was but \$2,443,000, so that but for the higher freight rates this road's profits would have been \$907,000 less than the year before. The \$3,350,000 gained by these higher rates is equal to 4⅞ per cent. on this company's capital stock.

And so we might go on, showing what a very large part of the profits of roads of this class depends upon keeping up the rates on east-bound freight, now carried at about ⅓ cent per ton per mile, while the lowest of the above quoted average rates on this freight for the year 1879 was 0.515 cent.

If there were the remotest probability that the present state of things would continue, this reduction of rates so far below what is reasonable would be a calamity not easily exaggerated. But of course it cannot last. The railroads may go on throwing away half a million a week for some weeks, or even a few months, but probably no one anticipates anything worse than this. It does not seem likely, however, that a restoration can now be made at short notice. Perhaps there are no time contracts, and probably the contracts for large quantities could be disposed of without much delay; but now lake and canal rates have been forced down; the number of vessels on the lakes which compete for the grain traffic is increasing, news of a new one of extraordinary capacity coming at short intervals; further, we are close to the dull season of July, which this year is likely to be duller than of late, because of the smaller crop and later ripening of winter wheat. With but little grain to carry (as is at least possible) until the spring wheat begins to come forward, about the first of September, the competition of the lake vessels with each other may keep down rates until September so as to make any considerable advance in rail rates difficult. At present not the slightest effort is being made to settle the troubles. It seems to be generally conceded that nothing can be done until there have been considerable losses.

As to the origin of the trouble, we have described it heretofore, and elsewhere in this number we show how there has been this year a great diversion of traffic from the New York Central, which at this end of the route has been mainly to the advantage of the Erie. This diversion, it seems established, was chiefly due to the cutting of rates by Western connections of the Erie, which the latter company repudiates as contrary to its instructions and intentions. However it happened, it was a condition of things which the New York Central could not be expected to permit. It showed conclusively that the arrangement for maintaining east-bound rates, consisting of pools over the Western roads only, with a simple agreement among their Eastern connections, was wholly ineffective, as every party to it has been told repeatedly. Now the remedy was and is to complete the pool and divide the traffic through to its destination. Efforts were made to do this, but though all professed to be anxious for a pool, some were too anxious to have their own way about the basis of the division, and hence nothing was done, and the present demoralization naturally followed, by which probably every trunk line will lose more than any difference between what it would claim and what it would get in a pool. It is not easy to see how any company can be benefited by a railroad war. It has been intimated that the low rates have been made in order to prevent the building of the numerous proposed new lines that would compete for this traffic. Now this is a perfectly

legitimate object. The existing roads must take care that the through business is not so profitable as to justify the construction of a new road to get a small share of it. But the way to do this is to reduce rates regularly, uniformly and permanently, and not to make a railroad war for a month or two. Further, it is quite doubtful whether at this date the roads already begun can be hindered. In certain conditions of the money market and the temper of investors capital can be had for such enterprises without much regard to the facts which determine whether it will be profitable or not; and whenever the money can be had the roads will be built, because there is money to be made in the building of them if not in the working of them.

Really, we cannot see how the position of the several roads that carry this traffic can be much changed by the contest that is going on. They will finally get together to settle their troubles, but apparently in no better condition to do so than before, except so far as they have a more realizing sense of the losses due to their former failure to agree.

GRAIN TRAFFIC OF NEW YORK RAILROADS.

The course of grain receipts at New York, that is, the relative quantities carried to that city by the different railroads, is a matter of peculiar interest at this time, because it is charged that great diversions of this traffic have been made recently from the New York Central, which has been the chief carrier heretofore, and on this account rates have been cut from the intended season rate of 30 cents per 100 lbs. from Chicago to New York to an open and common rate which is at least as low as 15 cents, and is reported to have been as low as 13 cents for some shipments. That is, because of the diversion charged, the whole east-bound traffic, extending over nearly the whole country north of the Ohio, east of the Mississippi and as far north as the lakes, including Chicago, Milwaukee, and river points south of Keokuk, is carried at an average rate of about one-third of a cent per ton per mile for grain and flour, and two-fifths of a cent for provisions, and the whole profits on this enormous traffic utterly destroyed—a traffic which at this time of the year with a 30-cent rate maintained probably yields more than \$1,000,000 per week, but which now can yield not much more than \$500,000. It is certainly worth our while to inquire, as minutely as may be, into the cause, at least the occasion, of this terrible sacrifice.

For the five months ending with May, the receipts of breadstuffs in bushels (grain and flour and meal reduced to equivalent in grain) at New York, by the different railroads, compare as follows this year with last:

	1881.	1880.	Inc. or Dec.	P. c.
N. Y. Cen.	15,223,872	18,001,242	Dec. 2,777,370	15.4
Erie	14,790,421	10,627,310	Inc. 4,163,111	39.2
Pennsylvania	8,556,993	5,915,860	" 2,641,133	44.6
Other roads	654,756	421,950	" 232,797	55.1
Total rail ...	39,226,042	34,966,371	Inc. 4,259,671	12.2
By water	7,525,481	9,334,524	Dec. 1,809,043	19.5
Total	46,751,523	44,300,895	Inc. 2,450,628	5.5

In the five months, the railroads altogether have delivered about 39,000,000 bushels of breadstuffs at New York, against 35,000,000 last year. But while there was an increase of 4,260,000 bushels (12.2 per cent.) in the aggregate, the New York Central had a decrease of 2,777,370 bushels, while there was an increase of 2,641,000 bushels on the Pennsylvania, and of no less than 4,163,000 on the Erie (39.2 per cent.) Most of the Pennsylvania's increase was in the first two months of the year, and is sufficiently explained by the severe winter, which diverted traffic from the more obstructed northern routes to it, and by the fact that deliveries at Philadelphia have been much smaller than last year (9,700,000 bushels, or 40 per cent. less). More remarkable is the great gain of the Erie (4,163,000 bushels), which was chiefly in February (480,000) April (1,150,000), and May (2,480,000).

The receipts by the several routes in successive months this year have been:

	January.	February.	March.	April.	May.
N. Y. Cen.	2,110,062	2,403,854	3,704,078	4,540,918	2,308,060
Erie	1,925,562	1,835,711	3,166,316	3,075,488	3,887,344
Penna.	1,727,091	1,436,280	1,828,902	1,588,272	1,976,448
Other	147,575	172,854	107,067	93,721	43,539
Total rail ..	5,910,290	5,908,699	8,806,363	10,204,399	8,306,291

The percentage of the total rail receipts delivered at New York by each road in each month of the five has been this year and last:

	N. Y. Cen.		Erie		Penna.		Other.	
	1881.	1880.	1881.	1880.	1881.	1880.	1881.	1880.
January.....	35.7	47.0	32.6	34.0	29.2	17.0	2.5	2.0
February.....	41.7	50.8	31.1	29.3	24.3	16.7	2.9	3.2
March.....	41.6	54.6	35.6	28.5	20.6	16.0	2.2	0.9
April.....	44.5	51.3	39.0	32.3	15.6	16.0	0.9	0.4
May.....	38.9	51.0	46.8	27.8	23.8	20.7	0.5	0.5
Five mos.	38.8	51.5	37.7	30.4	21.8	16.9	1.7	1.2

Thus, the New York Central, which last year brought more than half of the whole, this year has brought little more than three-eighths of it. Of the 12.7 per cent.

which it has lost, the Erie has gained 7.3, the Pennsylvania 4.9, and the other roads 0.5.

Complaint of diversions in February and March were made; but the present demoralization of rates is due to the course of business since April. Now, in the month of May, the New York receipts were:

<i>Receipts in May.</i>			
	1881.	1880.	Inc. or Dec. P. c.
New York Central.....	2,398,960	5,216,635	Dec. 2,817,675 54.0
Erie.....	3,887,344	3,506,042	Inc. 382,302 10.9
Pennsylvania.....	1,976,448	1,586,079	" 390,369 24.6
Other roads.....	43,539	22,863	" 20,671 90.3

Total..... 8,305,291 10,331,624 Dec. 2,024,333 19.6

Thus, while all the other routes gain, the New York Central has less than half the business that it had last year. The percentages in the two years were:

	N. Y. Cen.	Erie.	Penna.	Other.
1881.....	28.9	46.8	23.8	0.5
1880.....	51.0	27.8	20.7	0.5

The Pennsylvania's gain in percentage is not at all notable, but the Erie's is something astonishing. Of the 22.1 per cent. that the New York Central has lost the Erie has gained 19.

That we may see whether last year's distribution was exceptional or not, we give below the percentage received by each route in May for seven successive years:

	1875.	1876.	1877.	1878.	1879.	1880.	1881.
N. Y. Cen.	45.1	53.0	62.4	62.0	52.4	51.0	28.9
E.	32.0	36.5	24.0	24.0	26.2	27.8	46.8
Penna.	22.3	10.2	12.9	13.5	21.1	20.7	23.8
Other.....	0.2	0.3	0.7	0.5	0.3	0.5	0.5

Thus nothing remotely approaching the condition of things last May has occurred in any of the five previous years, during which until this year the New York Central has always delivered more than one-half of the breadstuffs arriving in New York by rail, and the Erie never more than 36½ per cent.

The rail receipts for the five months from Jan. 1 to May 31 have been for seven successive years:

New York Rail Grain Receipts, January to May.

Bushels:	N. Y. Cen.	Erie.	Penna.	Other roads.	Total rail.
1875.....	9,600,899	7,126,272	4,239,230	334,893	21,301,294
1876.....	12,416,105	7,874,572	3,000,150	390,478	23,675,314
1877.....	8,881,766	4,830,581	3,190,090	141,363	17,143,700
1878.....	21,451,257	8,911,400	5,107,077	496,499	36,026,743
1879.....	20,783,709	12,257,325	8,532,990	621,084	42,195,118
1880.....	18,001,212	10,627,310	5,915,860	421,959	34,966,371
1881.....	15,223,872	14,790,421	8,556,993	654,756	39,226,042

Per cent:

1875.....	45.1	33.4	19.9	1.6	100.0
1876.....	52.4	33.3	12.7	1.6	100.0
1877.....	51.8	28.8	18.6	0.8	100.0
1878.....	59.6	24.7	14.3	1.4	100.0
1879.....	49.3	29.0	20.2	1.5	100.0
1880.....	51.5	30.4	16.9	1.2	100.0
1881.....	38.8	37.7	21.8	1.5	100.0

Here the change in the distribution, though pronounced, is less so than in the month of May, when the New York Central lost and the Erie gained most, but it is still very decided. In the seven years the New York Central never before carried so large nor the Erie so large a proportion of the whole. Still the New York Central in the five months brought a trifle more than the Erie, while in May it brought 38 per cent. less.

This great diversion of traffic from the New York Central, however caused, of course could not fail to excite the efforts of the managers of that road to prevent its continuance. We understand that it has not continued, at least not to the same extent, since May, but meanwhile rates are broken with little prospect of being restored until after harvest. Under these circumstances, with a rate of not more than 9 cents a bushel for wheat and 8.4 cents for corn by rail from Chicago to New York, either rates or shipments by the lakes and canal must be decreased. The rates have already gone down—from 4½ to 2¼ cents on corn by lake, and from 4½ to 4 by canal—a total reduction of 2¼ cents, against 5.6 reduction in the rail rate. Yet the vessels seem to get cargoes without difficulty, and so far we do not hear of any considerable increase of rail shipments from lake ports. The figures for the receipts at New York for the five months ending with May include but a few days this year during which boats arrived from Buffalo, canal navigation having opened late. In some of the other years there were canal arrivals for a full month in this period. Comparisons of the receipts and percentages by water this year, therefore, have comparatively little value; but the figures will be useful in connection with future reports of canal receipts. The number of bushels received by rail and by water in the five months ending with May and the percentage of each of the total have been as follows in successive years:

Rail and Water Receipts at New York, January to May:

Year.	Rail.	Water.	Total.	By rail.	By water.
1875.....	21,301,294	1,194,522	22,495,786	94.7	5.3
1876.....	23,675,314	6,728,139	30,403,453	77.9	22.1
1877.....	17,143,700	4,420,960	21,570,760	79.5	20.5
1878.....	36,026,743	13,092,898	49,119,641	73.3	26.7
1879.....	42,195,118	4,644,462	46,839,580	90.1	9.9
1880.....	34,966,371	9,334,524	44,300,895	78.9	21.1
1881.....	39,226,042	7,525,481	46,751,523	83.9	16.1

There were scarcely any arrivals by canal this year in May of boats that cleared from Buffalo, but the canal receipts were wholly or almost wholly by boats frozen up in the canal last fall. Yet we see that only in

two other years of the seven have receipts by water been greater. About one-fourth of them were by coasting vessels from other points on the coast (being more flour than grain), and the rest is by canal. The tendency of the low rail rates now ruling is doubtless to decrease somewhat the receipts by canal, for canal rates cannot be reduced very much. The lowest canal rates ever reached (in 1879) were 3¼ cents a bushel for wheat and 3¼ for corn, and these for less than two weeks; canal rates are but little above these now; but a more decided effect is likely to be an increase in the receipts at the ports which receive by rail exclusively. With the reduction of rail rates to the level of the lake-and-canal rate, New York ceases to have the advantage of the cheapest route, which ordinarily the canal gives it. The low rail rate also works against shipments to Montreal and New Orleans.

Erie Earnings and Expenses.

New York, Lake Erie & Western earnings in April were \$65,906, or about 4 per cent. greater this year than last, but as the working expenses were \$154,861 (16 per cent.) greater, there was a decrease of \$88,955 in net earnings, equal to 12½ per cent. This would be more unfavorable than it actually is were not the net earnings at this time last year extraordinarily large. For the month of April for four years the gross earnings, expenses and net earnings have been:

	1878.	1879.	1880.	1881.
Earnings.....	\$1,127,079	\$1,372,755	\$1,043,151	\$1,709,057
Expenses.....	801,755	964,455	902,827	1,117,689

Net earnings..... \$235,324 \$408,300 \$680,323 \$591,368

There has thus been an uninterrupted increase in the gross earnings, though this year at a much slower rate, as was to be expected (32 per cent. from '78 to '79, 20 per cent. from '79 to '80, and 4 per cent. from '80 to '81). Net earnings, though 12½ per cent. less than last year, were 45 per cent. more than in 1879 and 151 per cent. more than in 1878. Those who expected that the increase of 67 per cent. in net earnings would be repeated this year are disappointed, but such an expectation was wholly unreasonable.

For the seven months of the fiscal year ending with April the gross earnings were 13¼ per cent., the expenses 15¼ per cent., and the net earnings 9½ per cent. greater than last year. This latter is a very considerable increase; but the increase was made in the first quarter of the fiscal year. At the end of that quarter (Jan. 1), the increase in net earnings over last year was \$505,604, which is just about equal to a 6 per cent. dividend on the preferred stock; now it has fallen to \$357,375. The present prospect for the trunk lines is that they will earn less and not more than last year for the remaining months of the fiscal year. A through rate of 15 cents (or less) per 100 lbs. on grain from Chicago to New York (and as early as last Friday this was the open and general though not generally announced rate from Chicago) is not favorable to earnings, and much less so to profits. For the seven months ending with April the gross earnings, expenses and net earnings of the Erie for four years have been:

	1877-78.	1878-79.	1879-80.	1880-81.
Earnings.....	\$9,271,136	\$9,144,777	\$10,494,485	\$11,849,557
Expenses.....	6,379,018	6,422,852	6,725,142	7,752,839

Net earnings..... \$2,892,118 \$2,721,925 \$3,769,343 \$4,096,718

The increase in gross earnings for the seven months is larger (in amount) this year than in any other; but \$796,000 of the \$1,385,000 of increase was made in the three months before January. The expenses did not vary much in the first three years, and the increase this year of more than a million dollars is very large. Of course the weather accounts for a very large part of it, as is indicated by the fact that of the whole increase of \$1,027,000 only \$290,000 was incurred in the first three months of the seven. But it must be remembered that nearly everything costs more this year than last, and also that this road has had a larger traffic to carry, so that there would probably have been a considerable increase of expenses, even if the weather had been favorable. The net earnings, though but 9½ per cent. more than last year, are 50 per cent. greater than in 1879, and 41 per cent. greater than in 1878.

For the four months ending with April the Erie's earnings and expenses compare as follows with the Pennsylvania's:

—Pennsylvania.				—Erie.			
	1881.	1880.	P. c. of inc.		1881.	1880.	P. c. of inc.
Earnings..	\$13,889,518	\$12,724,081	8.8		\$9,425,521	\$5,896,708	16.1
Expenses....	8,069,704	7,186,570	10.9		4,438,095	3,721,653	19.7
Net earnings	\$5,819,804	5,605,111	3.8		\$1,087,426	\$2,115,655	7.9

Net earnings \$5,819,804 5,605,111 3.8 \$1,987,426 \$2,115,055 *7.0

* Decrease.
The percentage of increase in gross earnings thus was larger on the Erie than on the Pennsylvania, but the rate of increase of expenses so much greater that while the Pennsylvania's net earnings increased 3.8 per cent. the Erie's decreased 7 per cent. The progress of both, however, has been in the same direction and at not very dissimilar rates.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

International & Great Northern.—Extended from Chicane, Tex., west by south 6 miles.

Southern Pacific.—Extended from El Paso, Tex., east by south to Yelita, 25 miles.

Texas-Mexican.—Extended west by south to Aguilares, Tex., 73 miles. Gauge, 3 feet.

Missouri Pacific.—The Lexington & Southern Division is extended southward to Lamar, Mo., 5 miles.

Texas & St. Louis.—Track laid from Corsicana, Tex., southwest 10 miles, and from Waco northeast 16 miles.

Central, of New Jersey.—The Long Branch Division is extended from Point Pleasant, N. J., south to Bay Head, 3 miles.

This is a total of 138 miles of new railroad, making 1,872 miles this year, against 1,768 miles reported at the corresponding time in 1880, 732 miles in 1879, 482 miles in 1878, 595 miles in 1877, 656 miles in 1876, 336 miles in 1875, 603 miles in 1874 and 1,387 miles in 1873.

PENNSYLVANIA RAILROAD EARNINGS, on all lines east of Pittsburgh and Erie, in the month of May, were \$438,981, or 12.8 per cent. larger than last year, and larger than in any previous month this season, than in any month in 1880 except October, and not equalled before since the busiest months of the Centennial year, being 44 per cent. larger than in May of 1879. Meanwhile the expenses were \$227,323, or 11 per cent. less than last year, leaving an increase of \$211,658, or 14½ per cent., in net earnings—certainly a very handsome increase in profits, considering that they were very large last year. For five successive years the gross and net earnings and expenses in the month of May have been:

	Gross earnings.	Expenses.	Net earnings.
1877.....	\$2,583,447	\$1,593,943	\$989,503
1878.....	2,503,441	1,529,911	973,530
1879.....	2,708,694	1,674,603	1,034,091
1880.....	3,417,915	1,941,064	1,476,851
1881.....	3,850,896	2,168,387	1,682,509

Compared with 1878, when earnings were lightest, there is an increase of 54 per cent. in receipts, of 42 per cent. in expenses, and of no less than 73 per cent. in net profits.

For the five months ending with May there is an increase of \$1,533,808, or 9½ per cent., in gross earnings, and of \$1,107,357, or 12 per cent., in expenses, leaving a gain of \$426,451 (6 per cent.) in net earnings over those of 1880, and of \$2,263,752 (43 per cent.), over those of 1879. The gain over last year, together with an increase of \$387,953 that has been made in the profits of the lines west of Pittsburgh, are equal to nearly 1.2 per cent. on the company's capital stock. The gross and net earnings and expenses of the road for the five months from January to May, for five years, have been:

	Gross earnings.	Expenses.	Net earnings.
1877.....	\$11,890,220	\$7,994,149	\$3,896,071
1878.....	12,071,738	7,630,173	4,441,565
1879.....	13,023,249	7,778,588	5,244,661
1880.....	16,212,596	9,130,634	7,081,962
1881.....	17,746,400	10,237,901	7,508,413

Thus gross earnings have been about one-half greater this year than in 1877, and net earnings nearly twice as great. The first half of the year 1877, however, was the worst of all years for trunk-line earnings and profits. The Pennsylvania Railroad Company doubtless suffers more from the present very low east-bound rates than any other, because it has a vastly greater mileage whose profits and losses it enjoys and suffers. The Vanderbilt roads altogether have just about the same amount of through traffic, but these are four companies, each of which is financially independent of the others.

THE NUMBER OF IMMIGRANTS IN MAY, as reported by the Bureau of Statistics, was 117,482, while for the eleven months ending with May it was 564,294. The latter is equivalent to 1.1 per cent. of the population, while the other increase (aside from immigration) is at the rate of about 2¼ per cent. This will make the whole increase of population during the year since the census was taken about 1,800,000, making the population in the United States at the end of this month just about 52,000,000. A great mistake is often made in not allowing for the yearly increase of population for some years after the census is taken; but by observing the immigration the population at any time between two censuses can be calculated with sufficient accuracy for all practical purposes—that is, for the country as a whole; it cannot be done for particular states and cities, at least not for the newer ones.

How nearly this can be done may be seen by the estimates made at the time of the census of 1870 by Mr. E. B. Elliott, of the Bureau of Statistics, for the population of future years. He estimated the number in 1880 at 50,852,000; it proved, by enumeration, to be 50,152,000. Yet Mr. Elliott, of course, had to estimate the immigration as well as the natural increase. If the increase from 1880 to 1890 is at the same rate (30 per cent.), it will bring the population up to 65,000,000 at that date. Thirty per cent. yearly, however, is not 3 per cent. a year, by any means, however, as so many amateur statisticians make it, but only about 2½ per cent.

We are not likely, however, to have an increase of 30 per cent. in the current decade, for the reason that immigration, unless very much larger than ever before, will not be so large a percentage of our present population. In 1870 an immigration of 386,000 added 1 per cent. to the population; now it requires 520,000 to make 1 per cent. Europe may lose population at that rate for a few years, but probably not for ten in succession. The supply of labor will be lessened, and this is likely to improve the condition of those left behind, so as to keep many of them at home who, under the present condition of things, would come here. Moreover, times will not always be as prosperous as they are now in this country; and when the next depression in industry comes wages will fall, it will be hard to get work, and immigration will fall off as it did after 1873.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

Thirteenth Annual Convention.

The annual convention of the American Society of Civil Engineers actually began this year at Niagara Falls, Saturday, June 11. About 90 persons, members and members' wives and daughters had assembled there. The professional

event of Saturday was a visit to the Suspension Bridge, where the work of the renewal was explained by the engineer of the work, Mr. L. L. Buck, and by the bridge company's Superintendent, Mr. W. Z. Swan. Mr. Buck's description of this work made one of the best of the papers read afterward at Montreal. A short visit was made by a few of the members to the canal of the Hydraulic Company and a special train took some of the party down to the wreck of the old suspension bridge, near Lewiston, which hangs as it has hung for 25 years, a melancholy spectacle. The cables are apparently still sound, and fragments of the floor system still swing above the torrent.

The franchise of the water-power company mentioned above has existed, I believe, many years, but it is only quite lately that systematic schemes have been set agoing to use the immense privilege that it commands. A canal has been made, taking the water above the falls and delivering it at the edge of the cliff below. This canal is 70 ft. wide and 10 ft. deep, and the fall that can be made available is some 250 ft. It was roughly estimated that the canal can supply 30,000 horse-power. Probably there is now in use less than 2,000 horse-power. The company has lately dug a pit, in solid rock, 86 ft. deep, with a tunnel to discharge from the bottom of the pit into the ravine.

In this pit will be put a turbine of 1,100 horse-power to supply power to two mills now building.

The use to which this unparalleled water-privilege will be put in the future will no doubt depend mostly on the transportation companies.

Monday morning the party went to Toronto, passing without stopping at the Welland Canal, rather to the disappointment of many. At Toronto they were driven through the town, stopping to see the action of the "Haggas Water Elevator" in filling locomotive tanks. This system is the subject of one of the papers presented at the convention. The drive ended at the house of Col. Gzowski, where luncheon was served on the lawn, and at about half-past two the party left by steamer for Montreal. No stops were made at the canals, as the boat ran the rapids. The party landed at Montreal at about 7 o'clock Tuesday night.

Wednesday morning, the 15th, the first official meeting of the convention was held in a hall of McGill University. The Society was welcomed by the Mayor, the Presidents of the Board of Trade and the Corn Exchange, and Principal Dawson, of McGill University. Col. Thomas C. Keefe was elected Chairman of the convention. After the speeches of welcome and the response by Mr. Welch, the Secretary announced the following papers to be read before the convention: "The Reinforcement of the Anchorages and Renewal of the Suspended Superstructure in Iron of the International Railway Suspension Bridge at Niagara Falls," by L. L. Buck; "Comparative Economy of Light and Heavy Rails," by Ashbel Welch; "Wrought-iron Columns," by Clarke, Reeves & Co.; "Repairs of Masonry," by O. Chanute; "Weights and Measures," by C. Latimer; "Strength and Durability of the Copper-Tin-Zinc Alloys," by R. H. Thurston; "Note on Standard Time for Railways, Telegraphs and Civil Purposes Generally," by Sanford Fleming; "Montreal Harbor Improvements," by G. D. Ansley, for James Shearer; "Sewerage Systems," by R. Hering; "Improved Level," "Water Elevator," by Edward Wragge.

The Secretary then read Mr. Buck's paper, of which an abstract will be given later.

This was followed by Mr. Fleming's paper on "Standard Time."

He spoke of the growing inconveniences of an indefinite number of arbitrary meridians and of the impossibility of each place, great or small, regulating the movements of its neighbors according to its local time. "It is proposed that the community unite in an effort to simplify the system now in use by reducing the number of time-standards to a minimum, by substituting for an indefinite number of irregularly-established and purely local standards a few main standards, each one having a fixed and well-known relation to all the others. It is proposed to have these standards established and maintained by governmental authority; to have them regulated with precision through a common central observatory, and through these standards it is proposed to keep every town, city, railway and steamboat clock throughout the land as nearly as practicable in perfect agreement. The plan of arrangements favored by the Metrological Society, New York, and the Canadian Institute, Toronto, is to have the standards so established that they will be exactly one hour apart." The chief signal office at Washington offers to drop time balls at all important stations, and the Chief Director of the Meteorological Department of Canada would co-operate in every practicable way. It is proposed by the American Metrological Society and the Canadian Institute to have 24 standard meridians, one of which shall be a time zero to be common to all nations. This prime meridian or time zero should be near Behring's Strait, 180° from Greenwich. The division of the day into two halves is to be discouraged, but the hours of the cosmopolitan day should be numbered from I. to XXIV. This scheme of cosmopolitan time is being brought before various European societies under distinguished auspices. Mr. Fleming suggested that "a committee be appointed to examine and report at a future meeting."

The afternoon of Wednesday was passed in a drive and a garden party.

At the evening session President Francis read his Annual Address.

He stated that the total membership of the Society is now 636, of whom 11 are honorary members and three are corresponding members. During the last year 11 members have been lost by death and resignation and 56 have joined. The library contains 8,850 books and pamphlets, of which a catalogue is now preparing. Here it may not be amiss to again call attention to the valuable index to current railroad literature now given in Part I. of this catalogue. After this brief preface of society statistics, the President's address was an historical review of the development of water-power in America, in which he said that the usual process of developing a water power by a company, who acquire the property, construct dams and races, and lease mill sites and power, is "distinctly an American idea, and the only instance where it has been attempted abroad, that he knows of, is at Bellgrande, in France, where the fall on the Rhone is 33 ft." An interesting account was given of the manner of formation of anchor ice, drawn from Mr. Francis' experiments and observations. After this address there was a short and unimportant discussion of Mr. Fleming's standard time scheme, and the following committee was appointed to consider and report upon the subject: Sanford Fleming, Charles Paine, A. J. Cassatt, J. M. Toucey, J. E. Hillgard, T. Eggleston and T. G. Ellis.

The only discussion of Mr. Buck's paper on the Renewal of the Niagara Bridge was a few words of warm praise from Mr. Chesbrough and Mr. Boller.

The Secretary then read a short paper by Mr. O. Chanute on "Repairs of Masonry." It was an account of the repair and strengthening of nine culverts and tunnels and the piers of two bridges by the use of béton. There was no attempt to give formulae for mixing the béton, or any figures as to the thickness required under various circumstances, as it had been preferred to let the work by lump contract to the patentees in America of the process, who were expert in

handling the material. The piers of the Portage bridge were found too weak to stand under the localized strain of the new iron structure and were capped and partly inclosed with béton. The Channel piers of the West Paterson bridge, which showed signs of going to pieces, were encased with béton. The Bergen tunnel and various culverts were lined with béton after masonry had become quite unsafe. In every case the use of béton had been entirely successful, and the cost had never been more than one-fourth that of renewing the masonry.

A minority report was then read from the committee to consider the question of the employment of civil engineers on public works. The report recommended a form of memorial to Congress. The Convention adjourned to Friday.

Thursday, the 16th, the Society and the local committee at Montreal, and some guests, went to Ottawa by a special train on the Quebec, Montreal, Ottawa & Occidental Railway, returning to Montreal the same evening. At Ottawa they visited some of the great saw-mills, the pumping-works of the city, and the Parliament buildings, and were entertained at a handsome luncheon. Returning, the train stopped a few minutes on the Chaudière bridge, built by Clarke, Reeves & Co. Ottawa is a town of 28,000 people, and in 12 years it has expended \$1,770,000 for city public improvements alone, of which \$1,014,000 was for water-works. It has direct water communication with Kingston by the Rideau Canal, down which passes a great deal of its lumber product.

Two hundred million feet, b. m. of sawed lumber is produced a year, the greater part of which goes to the United States. Most of it goes by water, but the railroads are taking more and more.

A saw-mill, even when it turns out 100,000 ft. of lumber a day, is not a beautiful object, nor do acres upon acres of piled lumber make a lovely foreground in a landscape, and there is a sense of incongruity in finding the Parliament buildings of Ottawa the centre of a scene made up of saw-mills and lumber-yards and raft-obstructed streams, for they are certainly the noblest group of buildings in America; but the American engineers must have felt an inward delight in the splendid architecture and the rude and busy life around it, for only in a very new and very vigorous country could such incongruities be seen.

Friday morning a session was held. Mr. Ashbel Welch read a paper on "Comparative Economy of Light and Heavy Rails." An abstract will be given.

The following members were elected a nominating committee to prepare the list of officers to be balloted for at the next election: William E. Worthen, New York; John Kennedy, Montreal; John McLeod, Louisville; Arthur F. Wrotnowski, New Orleans; Moses Lane, Milwaukee.

In the afternoon there was a sail in the harbor, and visits were made to the Victoria Bridge and the works of the Grand Trunk Railway. In the evening the Society gave a reception at the Windsor Hotel. Saturday morning the final session was held.

The following papers were read:

"Wrought-iron Columns," Clarke, Reeves & Co.; "Copper-Tin-Zinc Alloys," R. H. Thurston; "Sewerage Systems," R. Hering; "Weights and Measures," C. Latimer.

A committee was appointed to investigate the subject of iron and steel tests, consisting of Messrs. T. Eggleston, A. P. Boller, F. Collingwood, T. C. Clarke and W. Metcalf. The convention then adjourned.

Many of the Society availed themselves of the courtesy of the Grand Trunk Railway company, who gave them a special train to Quebec Saturday evening and free transportation to Portland when they chose to take it. The Grand Trunk also gave the members of the Society free transportation west, probably as far as Detroit.

The local committees and the officers of the various railways of the vicinity were uncasing in their hospitality and attention. Wherever in Canada the Society went it was received with great cordiality and consideration. The members must certainly feel that they were handsomely treated.

In conclusion we may glance hastily at the Canal System between the great lakes and the Atlantic. From the Straits of Belle Isle to the head of Lake Superior is 2,384 miles. On this route are 70% miles of canal with 550 ft. of lockage. This is exclusive of about 30 miles of dredging in the river between Montreal and Quebec. The scheme is to make a ship channel 25 ft. deep up to Montreal. About 6,250,000 cubic yards have been dredged since 1874, out of 8,000,000 to be removed. It is expected that the 25-ft. channel will be completed next year. The locks of the canals from Montreal to Lake Erie are to carry 14 ft. of water on the sills, and to be 270 ft. long by 45 ft. wide in the chambers. The Welland Canal will be opened with 12 ft. in July. It is hardly likely that, even when the enlargement of the St. Lawrence canals is completed, lake propellers will load at Chicago and discharge at Montreal, and it is far less likely that vessels will ever load on the lakes and go directly to sea. It will not be found economical to use lake and ocean-going steamers in the rocks and rapids of the upper St. Lawrence. Grain will be transhipped at the foot of Lake Ontario and again at Montreal, as it is now when arriving in the small vessels that pass through the present canal. In view of this, new large lines and elevators are projected. It will be seen that for a certain portion of the crop of the Northwest, the question whether it is to be exported from New York or from Montreal will be one of relative economy in handling at the points of transshipment, and while we must admire the energy and foresight of the engineers and merchants of Montreal, we need not worry about the supremacy of New York.

Mr. Gowen's Address.

Every part of the Academy of Music except the amphitheatre was crowded last evening, with an audience at least one-third composed of ladies, which had come to listen to an address from Franklin B. Gowen, Esq., upon "The position which the city of Philadelphia should occupy to the Commonwealth of Pennsylvania, to the transportation lines, and to the railway problem of the day." At eight o'clock Gen. Robert Patterson stepped to the front of the stage, and in a few well-chosen remarks introduced the speaker of the evening. Mr. Gowen plunged at once into his subject, referring from time to time to a large map, depicting the points touched by the Reading and Pennsylvania roads and their connections. He first spoke of the position which Philadelphia should bear to the commonwealth. It should, he said, be the commercial and industrial metropolis of the state and the factor of its products. Pennsylvania contained enough wealth, if properly collected and distributed, to entitle this city to rank as the first in America. Yet with all this, the opportunity had been neglected, and enterprise directed to the commerce of the West. Philadelphia should have its ports upon the Atlantic and the lakes—a project contemplated by the Reading road. There were but two great railway systems pertaining to Philadelphia at present existing—the Pennsylvania and the Reading. All others had been merged into these, and they must be looked to for whatever development might be made in the resources of the commonwealth. The Pennsylvania Railroad, with a disregard of the best interests of the state, had reached out and secured Western traffic, carrying the goods directly

through Philadelphia to the New York market. That road had secured avenues of transportation in the state simply for the purpose of preventing business being done upon them. The Pennsylvania had tried to render it almost impossible for refiners here to obtain the products of the oil fields. The Reading had endeavored to bring the crude petroleum to Philadelphia stills, but had been notified that to run over three miles of the Pennsylvania tracks \$20 per car would be charged, and the project was given up.

Mr. Gowen then further traced the policy pursued by the Pennsylvania road in leasing different lines, claiming that they had up to the time of the last report made a loss of \$5,986,113.42 upon the United Railroads of New Jersey Division alone, but which line it was necessary they should have to obtain an outlet at New York for the Western traffic, to the detriment of Philadelphia interests. The Reading had also a New York outlet via the Bound Brook route, but it was operated in the interests of the city. The Reading did its full duty to Philadelphia, to which it brought the trade incident to the clothing and feeding of the vast army of men employed in the anthracite coal fields, the coal itself, and other products of the mines and factories. Under the Pennsylvania management Philadelphia derived no benefit from the transportation and shipping of Western grain, the road carrying it direct to New York. The object of the city should be to frown down all such things as these, and to regain a portion of its former business with different sections of the state. The Reading road had in contemplation several projects for the construction of railways connecting with the main line, for the purpose of bringing coal into Philadelphia, but recent litigation had called a halt and compelled the management to wait until the unsettled state of the company was at an end. Capitalists and business men were afraid to invest for fear the road might eventually get into the hands of the Pennsylvania. That this was fully intended, Mr. Gowen did not for a moment doubt, and cited numerous reasons why he believed so. The evidence of this was so strong and the danger to the state so great, that the meeting had been called to warn citizens of their peril. The officials of the Pennsylvania had thrown everything they could in the way of the Reading borrowing money, and hampered it all they could with the view of ultimately getting it into their own hands. He was determined, however, that if they did, it should be by paying such a price for the stock that they could not afford to wreck the line. If the decision of the court had not been adverse, the Reading would now be out of debt, out of the hands of the receivers, and prosperous. Mr. Gowen closed his speech by denouncing the unjust acquisition of wealth by railway officials, the unjust discrimination of rates in favor of individual companies or firms, and the corrupt control of political power by corporations and their agents. The remedy for all these evils lay with the courts of law, and not with Congress or the Legislature. No state in the Union had suffered so much from corrupt control of political power as Pennsylvania, and no company in the United States was so guilty in this connection as the Pennsylvania Railroad. This policy had gained it the ill will of all honest people, and it would have fared better had it never tampered with the Legislature. It could not maintain discipline over its employees, for they knew too much to risk discharging them, and to this might be attributed the accidents recently occurring upon the road. To enter even the vestibule of the Pennsylvania railroad office meant to get rich. With the Reading it was different, and no man could say that any officer of the road ever made a dollar from his connection therewith except in a fair and legitimate manner. Mr. Gowen predicted better days for the state and his own road in the future, but said that unless the Pennsylvania should heed the warning of the gathering storm against it, its fate was sealed.—*Philadelphia North American*, June 17.

British Railroad Rates.

The evidence given before the Parliamentary Committee on Rates and Fare on the 26th and 30th of May gave the following examples of rates on English and Irish roads: Coal, Belfast to Armagh, 39 miles, 3s. 6d. per ton; Belfast to Ballaghaderin, 17 miles, 3s. 6d. per ton; Wigan to Chester, 36 miles, 2s. 6d. For less than 20 tons an additional charge of 1s. 1d. per ton.

Artificial manure, Larne to Castle Dawson, 50 miles, 8s. per ton; Belfast to Castle Dawson, 41 miles, also 8s.; Belfast to Omer, 66 miles, 10s.; Dublin to Omer, 126 miles, 12s. 6d. For the shortest distance the rate is 4.2 cents per ton per mile; for the longest, 2.4 cents.

Flour, Birmingham to Belfast, 20s. 10d. per ton; Belfast to Monaghan, 55 miles, 9s. Iron, Belfast to Lisburn, 7 miles, 4s. per ton; Belfast to Ballymena, 24 miles, 8s. 4d.; Consett to Belfast, 260 miles (180 by rail), 14s. 6d.; Belfast to Enniskillen, 87 miles, 14s. 2d. (= 3.57 cents per ton per mile). Belfast to London the through rate for manufactured iron is 53s. 4d., but if consigned to firm in Liverpool and by it forwarded to London the cost is only 18s. 6d. The witness citing these rates said that after the amalgamation of the railroads the rates were all increased, and that the through rates are all made by a combination known as the "Railway and Steamboat Conference." He charged that the policy of the Irish roads favored some parts at the expense of others. The effect of the through rates and the high local charges was that it was cheaper to buy iron in England to be sent to inland towns in Ireland than to buy it in Belfast.

A linen manufacturer of Belfast complained that the rate on linen from Belfast to Liverpool was 10s. per ton (by steamer), and from Liverpool to London 25s., while the through rate was 45s., and linen from any other country than Ireland would be taken from the ship to London for 25s., but if it came from Ireland 35s. was charged.

A Kent hop grower said that what was called the "packet rate" was charged on hops from Margate to London, amounting to 42s. per ton, while from Boulogne the charge was 20s. and from Folkestone 23s. 4d., and if hops were sent from London to Margate, as they are sometimes, the rate is 19s. 7d.—less than half what it costs to send them from Margate to London. Other rates given were: Leather, London to Guilford, 8s. 4d.; London to Harshaw, 8 miles further, 12s. 11d.; hops, London to Birmingham, 35s.; London to Worcester, 15 or 20 miles further, 25s.; wine and spirits, London to Cardigan, 209 miles, 75s. (= 70% cents per 100 lbs. = 5% cents per ton of 2,000 lbs. per mile); London to Newcastle-on-Tyne (a seaport), 275 miles, 31s. 8d. (= 2% cents per ton per mile). The Great Eastern Railway charged 25 and sometimes 30 per cent. for insurance, while the actual loss is only 2 per cent. Owing to the high insurance a wine and spirit merchant said he shipped on that road at his own risk, and his losses by pilfering on that road were more than on all other railroads put together.

The President of the Sheffield Chamber of Commerce said that there had been a large falling off of trade at Sheffield, with which high railroad rates doubtless had a great deal to do. He wished the Railway Commission to be authorized to deal with unequal rates. Manufacturers now are deterred from appealing to it on account of the trouble and expense.

The Secretary of the Cheshire Chamber of Agriculture had heard great complaints of the inequality and harshness of rates, chiefly with regard to rates on cheese, potatoes

seeds, hay and straw. American cheese was taken from Liverpool to London for 30s. per ton, 5s. of which was for dock dues. On Cheshire cheese from any station to London the rate was 42s. 6d. to 45s., though the station might be 20 miles nearer to London than Liverpool. The 25s. rate from Liverpool is equal to 2.3 cents per ton per mile; 42s. 6d. for the same distance would be 4 cents per ton per mile, or 46 cents from Detroit to Buffalo. The witness complained that this gave American cheese an undue advantage of Cheshire cheese. The fact being that steamers sailing directly to London from American ports take cheese for but little more than the Liverpool steamers, either the steamers to and the American cheese to London, abandoning the carriage London steamers, or they must make rates to suit.

This witness had heard that an agent from Canada had induced certain English railroads to make an agreement with railroads in Canada and the United States for carrying flour from Toronto at a reduction of 33 per cent. from the regular rates. On American meat 25s. was charged, while on English and Irish meat the charge was 50s. He complained of the great difference made in favor of freight carried at owner's risk and of excessive rates for short distances. "Several railways running into the same place did not affect the state of affairs very much, because as soon as a rival came into the field there was a consultation between the several competitors, and a uniform and probably the old rate was agreed upon."

A witness from Dublin gave as examples of a charge above the maximum permitted by law a rate of 38s. 4d. per ton from Dublin to Mullingar, 37 miles, equal to 16.3 cents per ton of 2,000 lbs. per mile; a rate of 70s. 10d. from Dublin to Roscommon, 96 miles, equal to 15.3 cents per ton per mile; 15.5 cents per ton per mile; Dublin to Dundalk, 54½ miles, 25s., or 11.25 cents per mile; Dublin to Portadown, 88 miles, 37s. 6d., or 9.12 cents per mile, etc. The maximum legal rate was 5d. per ton (of 2,240 lbs.) per mile on one road, and 4d. on another leading to these places.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends have been declared as follows:
Boston & Lowell, 2 per cent., semi-annual, payable July 1.
Old Colony, 3 per cent., semi-annual, payable July 1.
Denver & Rio Grande, 1½ per cent., quarterly, payable July 1.
Missouri Pacific, 1½ per cent., quarterly, payable July 1.
 Transfer books close June 18.
Chicago, Iowa & Nebraska (leased to Chicago & Northwestern), 4 per cent., semi-annual, payable July 1.
St. Louis & San Francisco, 3½ per cent., semi-annual, on the first-preferred stock, payable Aug. 1. This is the second dividend.

Foreclosure Sales.

The *Cairo & St. Louis* road will be sold in Springfield, Ill., July 14, by John A. Jones, Special Commissioner, under a decree of the United States Circuit Court. The sale will be absolute and free from redemption. The sale will be subject to the lien of the receiver's certificates outstanding and also to all sums due for taxes. A year ago there were about \$134,000 certificates out. A year ago ft. gauge, and extends from Cairo, Ill., to East Carondelet, 146.5 miles, its trains using the East St. Louis & Carondelet track for four miles to East St. Louis. The bonded debt is \$2,500,000. Terms of sale are \$100,000 cash, the balance of purchase money to be paid in cash or bonds when directed by the Court.

Central & Southern Pacific Railroad Employees' Mutual Benefit Association.

At the recent first annual meeting of this Association in San Francisco there was a full representation. President E. B. Ryan delivered an address.

The board of directors reported receipts of \$1,119; payments \$341, of which \$98 was for expenses; balance on hand \$778; dues in course of collection, \$507. One member died during the year. At the close of its first year the Association has 237 members. The report sets forth at length the advantages of the Association. (Since the meeting 30 members have been added.)

After electing officers and disposing of other routine business the Association adjourned.

Trunk Line Presidents' Meeting.

At a meeting held in Commissioner Fink's office, in New York, the presidents of the New York Central, Pennsylvania, Erie, and Baltimore & Ohio being present, it was resolved that they would not countenance or in any way participate in any time contracts on east or west-bound traffic, and that the Commissioner notify all parties in interest, and take such steps as may be necessary to enforce such resolution; that the presidents of each of the companies represented will give the same instructions to all lines and the Commissioner communicate with them respectively; and that the Executive Committee of the Western lines, requesting them to adopt such measures as may be necessary to maintain tariff rates.

ELECTIONS AND APPOINTMENTS.

Boston, Hoosac Tunnel & Western.—Mr. A. A. Gaddis having resigned the position of General Manager, the duties of that office will be performed hereafter by President Wm. L. Burt.

Buffalo, New York & Philadelphia.—At a meeting held in Buffalo, N. Y., June 16, J. W. Jones, Archer N. Martin, Jesse Seligman and E. F. Winslow were chosen directors in place of Richard Bullymore, Cyrus Clarke, Thomas Clark and James S. Metcalfe, resigned. The board then elected J. W. Jones Vice-President, in place of J. F. Schoellkopf, resigned. Mr. Jones is President of the Pittsburgh, Titusville & Buffalo Company.

Burlington & Northwestern.—At the annual meeting in Burlington, Ia., June 15, the following directors were chosen: Thomas Hedge, Charles Mason, E. D. Rand, Lyman Cook, W. W. Baldwin, T. W. Barhydt, David Leonard, Richard Spencer, Robert Donahue, George Millard, George O. Lanman, John S. Cameron, P. P. Squires, D. A. W. Childe, Norman Everson. The board re-elected T. W. Barhydt President; Charles Mason, Vice-President; R. M. Green, Secretary and Treasurer; John T. Gerry, Superintendent.

Central & Southern Pacific Railroad Employees' Mutual Benefit Association.—At the late annual meeting in San Francisco the following directors were chosen: F. S. Douth, J. E. Foulds, E. F. Gerald, Richard Gray, C. A. Grow, J.

O. B. Gunn, H. R. Judah, G. L. Lansing, E. B. Ryan. The board elected E. B. Ryan President; J. O. B. Gunn, Vice-President; G. L. Lansing, Secretary.

Chester, Iron Mountain & Western.—The directors of this new company are as follows: Charles B. Parsons, Boone Terre, Mo.; Leon Boggy, St. Mary, Mo.; Gerard B. Allen, Nathan Cole, Newton Crane, St. Louis; Charles B. Cole, Chester, Ill.; Charles Ridgely, Springfield, Ill.; Hugh N. Camp, James L. Hathaway, J. Wyman Jones, New York.

Chicago, Burlington & Quincy.—Mr. James W. Working has been appointed Acting Train-Master of the Iowa Division.

Mr. E. Ryder has been appointed Superintendent of the Galesburg Division, in place of Mr. H. Hitchcock, resigned. Mr. L. A. Howland succeeds Mr. Ryder as Assistant Superintendent of the Chicago Division.

Chicago & Northwestern.—The following circular from Second Vice-President and General Manager, M. Hughitt, is dated Chicago, June 20:

"Mr. J. D. Layne is appointed General Superintendent of the Chicago & Northwestern Railway Company, its proprietary roads and leased lines, to take effect July 1, 1881. The operation and maintenance of these lines of railway are committed to the department of the General Superintendent. All officers of the company so engaged will report to and receive their instructions from the General Superintendent."

Mr. Layne is well known as having been for several years General Manager of the lines worked directly by the Pennsylvania Company.

A circular from Mr. H. C. Wicker, Freight Traffic Manager, makes the following announcements:

"H. R. McCullough is appointed Division Freight Agent of the Galena Division, including Freeport Line and Fox River Line south of Crystal Lake; also, Iowa Division and branches, Des Moines Division, Iowa Midland Railway, and Toledo & Northwestern Railway. All communications pertaining to the local freight traffic of these divisions and branches should be addressed to him at Chicago."

"H. C. Barlow is appointed Division Freight Agent of the Winona & St. Peter Railroad and branches; also, of the place of H. R. McCullough, transferred to Galena, Minn., in divisions. All communications respecting the freight traffic of the Winona & St. Peter Railroad and Dakota Central Railway should be addressed to him at Winona."

Cleveland, Columbus, Cincinnati & Indianapolis.—Mr. J. H. Peabody has been appointed Contracting Freight Agent.

Clinton & Faison.—This company was organized at a meeting held in Goldsboro, N. C., June 7, by the election of Ashford, E. T. Boykin, I. R. Faison, J. A. Ferrell, J. C. Pass.

Detroit Union Railroad Depot & Station Co.—The directors of this company are: Russell A. Alger, George W. Balch, C. H. Buhl, James F. Joy, James McMillan, John S. Newberry, Allen Sheldon, M. S. Smith, all of Detroit.

East Tennessee, Virginia & Georgia.—The board of directors as reorganized is as follows: C. M. McGhee, E. J. Tenn.; W. C. Kyle, Whitesburg, Tenn.; E. W. Cole, Chattanooga, Tenn.; R. H. Richards, Atlanta, Ga.; T. G. Barrett, Augusta, Ga.; Calvin S. Brice, Lima, O.; Allen N. Dennish, J. Mitchell, Wilson Robinson, O.; George J. McGourkey, Seney, Tenn.; Thomas, McGourkey, Mitchell, Robinson, Seney and Shethar.

Grand Trunk.—The following circular from Wm. Wainwright, Assistant Manager, is dated June 15:

"The following changes in the staff will take effect from this date:
 "Mr. James Stephenson is appointed General Passenger Agent, with headquarters at Montreal, and all communications on the subject of passenger business must hereafter be addressed to him.
 "Mr. James Stevenson, Assistant Superintendent Atlantic District, will be removed to Montreal and have charge of Point, Lachine and Province Line.
 "Mr. A. Gregory will be removed to Richmond and take charge of the district between Richmond and Portland, and Richmond and Point Levi, these stations inclusive."

Illinois Central.—The board has re-elected Wm. K. Ackerman President; James S. Clarke, Vice-President; L. A. Catlin, Secretary; L. V. F. Randolph, Treasurer.

Indianapolis, Peru & Chicago.—Mr. Charles H. Rockfell, Auditor and General Freight and Passenger Agent, having resigned, Mr. L. G. Cannon, Treasurer, will act as General Freight and Passenger Agent for the present. Mr. O. M. Boyle will act as Auditor.

Indianapolis & St. Louis.—Mr. Wm. Henry has been appointed General Road-Master, in place of Robert Mark, re-Indianapolis Division of the Cleveland, Columbus, Cincinnati & Indianapolis.

Master Car-Builders' Association.—At the annual convention in New York last week, the election of officers was postponed one year, continuing for the year the old officers, as follows: President, Leander Garey, New York; Vice-President, M. P. Ford, Columbus, O.; Secretary, C. A. Smith, New York; Treasurer, B. K. Vebyrick, Chicago.

Master Mechanics' Association.—At the annual convention in Providence last week, the following officers were chosen: President, J. N. Lauder, Concord, N. H.; Vice-Presidents, Reuben Wells, Louisville, Ky., and James Sedgwick, Cleveland, O.; Secretary, J. H. Setchel, Cincinnati, O.; Treasurer, S. J. Hayes, Chicago, Ill. The only change is the substitution of Mr. Sedgwick as Vice-President for Mr. J. D. Barnett.

Missouri Railroad Commission.—Mr. H. H. Gregg, Secretary, gives notice that after July 1 next, the office of the Commission will be in Jefferson City, Mo., instead of St. Louis. All official communications should be addressed accordingly.

National Dispatch Line.—Mr. H. E. Graves has been appointed General Agent in Chicago, in place of Thomas Hoops, who has disappeared.

New York, Pittsburgh & Chicago.—This company has elected officers as follows: President, James S. Negley, Pittsburgh, Pa.; Vice-President, James A. Robinson, Kenton, O.; Secretary, James S. Negley, Jr., Pittsburgh; Treasurer, W. N. Riddle, Pittsburgh.

New York, West Shore & Buffalo.—The directors of this company as consolidated are: John B. Page, Rutland, Vt.; Charles Baird, Norwich, N. Y.; James W. McCulloh, Englewood, N. J.; George G. Nevers, Newark, N. J.; Charles H. Hinchman, Philadelphia; Charles J. Carda, Watson B.

Dickerman, Theodore Houston, Wm. M. Long, Henry K. McHarg, John J. McCook, John L. Nisbet, Samuel A. Strang, New York. The board has elected Charles Baird President; Alexander Taylor, Secretary and Treasurer.

Northern Pacific.—Mr. A. E. Law has been appointed Train-Master at St. Paul and will have immediate charge of all Northern Pacific trainmen at St. Paul and Minneapolis, subject to the rules and regulations of the St. Paul, Minneapolis & Manitoba Railroad.

Oconto & Shawano.—The directors of this new company are: George Beyer, H. M. Boyce, S. A. Coleman, C. S. Haut, W. M. Underhill, W. H. Webster. Office at Oconto, Wisconsin.

Ogdensburg & Lake Champlain.—At the annual meeting in Ogdensburg last week the following directors were chosen: Wm. J. Averell, Ogdensburg, N. Y.; Darius N. Lawrence, Malone, N. Y.; Horace Fairbanks, St. Johnsbury, Vt.; Warren K. Blodgett, Peter Butler, John S. Farlow, Vt.; Nathaniel J. Rust, Emmons Raymond, J. Thomas Morse, Boston, Mass. Messrs. Fairbanks, Blodgett, Butler, Farlow, Holmes, Morse, Raymond and Vose are new directors, succeeding John Q. Adams, N. Cushing, H. R. Duval, S. M. Felton, N. Fish, E. H. Harriman, J. W. Osborn and E. B. Phillips. The board elected Warren K. Blodgett President; H. A. Church, Secretary and Treasurer.

Pennsylvania.—The following appointments and transfers were approved at the meeting of the board June 22:

Sutherland M. Prevost to be Superintendent Philadelphia Division, in place of Wm. F. Lockard, resigned; H. H. Carter, Hutchinson, Superintendent Middle Division, in place of Mr. Prevost; J. B. Mr. Carter; Wm. M. Phillips, Superintendent Lewistown Division, in place of Mr. Hutchinson; W. C. Brown, Assistant Engineer Middle Division, in place of Mr. Phillips, promoted.

Petersburg.—The officers of this company as reorganized are: President, E. T. D. Myers; General Superintendent, R. M. Sully; Treasurer, W. P. Taylor; Auditor, L. E. Clark; Train Dispatcher, W. J. Brown. Offices in Petersburg, Virginia.

Philadelphia & Reading.—The Receivers have appointed J. Y. Humphrey their Secretary. They have also appointed Daniel Jones Comptroller. The two appointments are to succeed J. Brinton White, resigned.

Rock Island & Peoria.—At the annual meeting last week the following directors (one-half the board) were elected for two years: W. H. Decker, P. L. Cable, Rock Island, Ill.; board elected P. L. Cable President; R. R. Cable, Vice-President; Cornelius Lynde, Secretary; Joseph Gaskell, Treasurer.

Salt Lake & Park City.—The directors of this new company are: Hugh Anderson, Micajah T. Burgess, W. W. Chisholm, George A. Lowe, John T. Lynch. Office at Salt Lake, Utah.

St. Paul & Duluth.—The board has elected officers as follows: President, James Smith, Jr., St. Paul, Minn.; Vice-President, W. H. Rhawn, Philadelphia; Secretary and Treasurer, E. R. Sewell, St. Paul; Assistant Secretary, C. A. Richards, New York; Executive Committee, S. S. Merrill, J. Hill, E. W. Winter.

Sedalia, Warsaw & Southern.—This company has elected D. M. Edgerton President; D. H. Smith, Vice-President; John D. Crawford, Secretary; Cyrus Newkirk, Treasurer. Office at Sedalia, Mo.

Texas & Pacific.—Mr. C. W. Hammond is appointed Superintendent of Telegraph. He now holds that office on all the Gould Southwestern lines.

Toledo, Delphos & Burlington.—Mr. E. L. Lomax has been appointed General Passenger Agent.

Utica & Black River.—Mr. B. H. Bail has been appointed General Freight Agent, in place of Charles Hackett, resigned. Mr. Bail has been agent at Syracuse for the New York Central.

Valparaiso & La Crosse.—The directors of this new company are: J. P. Carey, C. D. Gorham, J. K. McCracken, Valparaiso, Ind.; J. T. Brooks, John E. Davidson, Thomas D. Messler, J. W. Renner, Pittsburgh, Pa. The organization is controlled by the Pennsylvania Company.

Vermont Valley.—At the annual meeting in Brattleboro, June 15, the following directors were chosen: J. M. Williams, Brattleboro, Vt.; John B. Page, Rutland, Vt.; Frederick Billings, Woodstock, Vt.; Bradley Barlow, St. Albans, Vt.; A. B. Harris, Springfield, Mass.; Henry C. Robinson, Hartford, Conn.; Gouverneur Morris, New York.

Wabash & Erie Fast Freight Line.—Mr. W. S. Spiers has been appointed General Manager. He was long General Freight Agent of the Toledo, Peoria & Warsaw, and since the sale of that road has retained the position under the title of Division Freight Agent of the Peoria & Iowa Division of the Wabash, St. Louis & Pacific.

PERSONAL.

—Mr. J. Brinton White has resigned his position as Secretary and Comptroller to the Receivers of the Philadelphia & Reading Railroad.

—Mr. W. R. Bixby, General Baggage Agent of the International & Great Northern road, was married at San Antonio, Tex., June 18, to Miss Lillian Tuttle, of that city.

—Mr. Wm. F. Lockard, Superintendent of the Philadelphia Division of the Pennsylvania Railroad, has resigned his position after nearly 40 years passed in the service of the company.

—It is reported that Mr. T. L. Pomeroy, General Passenger Agent of the Boston, Hoosac Tunnel & Western, has accepted a similar position on the Ogdensburg & Lake Champlain road.

—Mr. Lewis Wain Smith died in Franklin, N. Y., on June 17, while on his way to the Adirondacks for the benefit of his health. He was a lawyer of good standing in Philadelphia, and was a director and Counsel of the Wilmington & Northern Railroad Company.

—Mr. John M. Courtney, formerly President of the New York, West Shore & Chicago Company, died at his residence in Cornwall, N. Y., June 19, aged 56 years. For many years he lived in New Orleans, and was one of the first projectors of the New Orleans, Mobile & Texas road.

—Major Campbell Wallace, formerly president of the East Tennessee & Georgia Company and now one of the Railroad Commissioners of Georgia, celebrated his golden wedding recently at his residence in Atlanta. His children, grandchildren, great-grandchildren and a number of invited

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guests were present. Major Wallace is still a very active man, and a prominent banker in Atlanta.

—It is reported that Mr. John King, Jr., First Vice-President, and Mr. Wm. Keyser, Second Vice-President of the Baltimore & Ohio, have placed their resignations in President Garrett's hands. No reason for Mr. Keyser's action is given. Mr. King says that he has not resigned, but intends to soon, and expects to turn over the roads of which he is Receiver next fall, and then go to Europe for some time.

—Thomas Hoops, Foreign Freight Agent at Chicago of the National Dispatch Line, is missing, and it is reported that he has not accounted for checks to the amount of \$10,000, and that he has made contracts under which the National Dispatch will lose a considerable amount. Hoops was for some years General Freight Agent of the Michigan Central, and afterward General Agent of the Blue Line, and then had the reputation of a capable and trustworthy man. It is now reported that after he left the Blue Line he was found to be a defaulter, and that the Michigan Central protested against his appointment on the National Dispatch.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Five months ending May 31:				
	1881.	1880.	Inc. or Dec.	P. c.
Cairo & St. Louis.	\$171,370	\$144,835	I.	26,535 18.3
Des. M. & Ft.	123,205	110,932	I.	12,273 11.1
Det., Lansing & No.	409,233	465,899	I.	33,334 7.2
East Tenn., Va. & Ga.	824,318	737,659	I.	86,659 11.7
Houston, E. & W.	52,200	39,281	I.	12,919 33.1
Mem., Pad. & No.	95,513	81,441	I.	14,072 17.3
Nash., Chat. & St. L.	923,675	880,550	I.	43,125 4.9
Paducah & E'town	210,548	151,024	I.	59,524 39.4
Four months ending April 30:				
Chi., Bur. & Quincy.	\$5,335,289	\$6,067,022	D.	\$732,733 12.0
Net earnings.	2,283,226	3,144,038	D.	860,812 27.4
Cin. Southern.	628,194	628,194		
N. Y., Lake Erie & W.	6,425,521	5,836,708	I.	588,813 10.1
Net earnings.	1,967,426	2,115,655	D.	148,229 7.0
N. Y., N. H. & Hartford.	1,724,100	1,470,665	I.	253,435 17.2
Month of April:				
Chi., Bur. & Quincy.	\$1,574,371	\$1,489,894	I.	\$84,477 5.7
Net earnings.	699,057	693,892	I.	5,165 0.7
Cin. Southern.	173,929	173,929		
N. Y., Lake Erie & W.	1,709,057	1,643,151	I.	65,906 4.0
Net earnings.	591,308	680,323	D.	88,955 13.1
N. Y., N. H. & Hartford.	437,680	384,443	I.	73,237 19.1
Month of May:				
Atch., Top. & Santa Fe.	\$1,066,000	\$678,000	I.	\$388,000 57.2
Cairo & St. Louis.	31,158	28,800	I.	2,358 8.2
Central Iowa.	74,067	63,577	I.	10,490 16.4
Des. M. & Ft.	24,602	27,733	D.	3,131 11.2
Det., Lansing & No.	116,005	91,092	I.	24,913 27.4
East Tenn., Va. & Ga.	133,900	113,810	I.	20,090 17.6
Houston, E. & W.	11,709	6,634	I.	5,075 76.9
Mem., Pad. & No.	18,674	13,337	I.	5,337 40.1
Nash., Cuatta, & St. L.	164,431	158,839	I.	5,592 3.6
Net earnings.	64,415	27,813	I.	36,602 131.2
Paducah & E'town	40,904	27,813	I.	13,091 47.1
First week in June:				
Green Bay, Wisconsin & St. Paul.	\$8,109	\$5,650	I.	\$2,459 43.1
Ind., Bloom. & W.	28,743	28,864	I.	121 0.4
Ohio Div.	17,311	14,087	I.	3,224 23.0
Wabash, St. L. & P.	290,722	269,405	I.	21,317 7.9
Second week in June:				
Chi. & Eastern Ill.	\$33,704	\$19,843	I.	\$13,861 70.5
Chi., Mil. & St. P.	407,030	277,928	I.	129,102 46.4
Chi., St. P., Minn. & O.	78,127	50,329	I.	27,798 55.2
Louisv. & Nashv.	194,830	146,100	I.	48,730 33.6
Northern Pacific.	81,530	58,058	I.	23,472 28.8
St. L., I. M. & So.	120,600	92,084	I.	28,516 23.4
St. L. & San. Fran.	66,600	41,200	I.	25,400 61.5
Week ending June 10:				
Great Western.	\$85,136	\$92,768	D.	\$7,632 8.2
Week ending June 11:				
Chi. & Gd. Trk.	\$25,947	\$20,352	I.	\$5,595 27.4

Crop Prospects.

The Department of Agriculture at Washington reports the acreage of spring wheat as 86 per cent. of last year's, and the condition as good as last year at this time. For winter wheat the condition is reported as 76 per cent. of an average, while last year it was above an average.

The California crop appears likely to be considerably less than the very large one of last year.

The McCormick Harvester Company, to which the crop prospects are of great importance as a guide to the demand for its machines, collects information from its general agents, for nearly the whole country where considerable quantities of small grain are grown. It reports for Illinois a prospect for about one-half as much winter wheat as last year, for Indiana and Michigan about the same, for Ohio, Kentucky, Tennessee, Missouri, Kansas and Southern Nebraska a good crop, which for Kansas promises to be as good as ever was grown there. For spring wheat the company estimates an increase of one-eighth in acreage (while the Department of Agriculture reports a decrease of 14 per cent.), and a generally good condition at this time.

Grain Movement.

For the week ending June 11 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Northwestern		Northwestern shipments.		Atlantic	
Year.	Receipts.	Total.	By rail.	P. c. by rail.	Receipts.
1874.	4,217,324	4,089,948	739,787	18.1	4,506,355
1875.	2,499,349	2,518,909	1,084,679	43.1	2,879,202
1876.	5,091,926	5,313,216	2,394,811	45.1	5,123,251
1877.	2,076,791	2,166,457	664,033	30.6	1,656,278
1878.	2,660,004	3,576,261	778,483	21.9	4,984,836
1879.	4,773,299	5,002,852	2,706,245	54.0	6,065,502
1880.	5,754,274	6,991,823	1,727,929	24.7	7,633,849
1881.	7,320,207	6,178,104	1,634,114	26.4	5,743,708

The receipts of the Northwestern markets were 9 per cent. less than the previous week, but 27 per cent. more than in the corresponding week of last year, and larger than in any other week except the previous one this year. The shipments of these markets were one-fourth more than in the previous week, but about the same as in the two weeks before that, and 11½ per cent. less than in the correspond-

ing week of last year. The rail shipments were about the same as in the corresponding week of last year; besides these, 309,674 bushels, or 5 per cent. of the whole, were shipped down the Mississippi. The Atlantic receipts were the smallest for four weeks, and smaller than in the corresponding week for two years previous.

Of the Northwestern receipts Chicago had 54.2 per cent., St. Louis 17.3, Toledo 8.8, Peoria 8.8, Milwaukee 8.4, Detroit 1.6, and Cleveland 0.9 per cent. The Chicago receipts, though somewhat less in quantity than the previous week, are a larger proportion of the whole than in any other week this year; St. Louis maintains its position well, but the decreases from the preceding week are larger in proportion at Milwaukee and Toledo.

Of the Atlantic receipts New York had 50.8 per cent., Baltimore 14.2, Philadelphia 11.8, Boston 10.7, Montreal 6.6, New Orleans 5.7, and Portland 0.2 per cent. While there was, compared with the previous week, a loss of 976,000 bushels in the aggregate, there was a gain of 592,000 at New York, and of 63,000 at Boston, with large decreases elsewhere.

Exports from Atlantic ports for five successive weeks have been:

	June 15.	June 8.	June 1.	May 25.	May 18.
Flour, bu.	87,677	89,679	73,573	91,901	101,310
Grain, bu.	4,039,736	4,531,310	5,949,131	3,280,568	3,114,802

Receipts and shipments at Chicago and Milwaukee for the week ending June 17 were:

	Receipts.		Shipments.	
	1881.	1880.	1881.	1880.
Chicago	3,867,000	3,357,057	3,246,466	3,715,528
Milwaukee.....	589,568	286,673	657,724	1,019,754

Receipts thus were 15 per cent. larger at Chicago and 106 per cent. larger at Milwaukee than last year; but shipments 12½ per cent. smaller at Chicago and 35½ per cent. smaller at Milwaukee.

For the same week receipts and shipments at Buffalo were:

	Receipts.		Shipments	
	1881.	1880.	1881.	1880.
By water	3,498,000	4,131,740	1,286,500	3,715,528
By rail.....	479,000	286,973	999,000	1,019,754

Total... 3,977,000 4,418,713 2,285,500 4,735,282

In receipts there is a decrease of 15½ per cent. by lake and an increase of 67 per cent. by rail; in shipments a decrease of 65½ per cent. by canal and of 2 per cent. by rail.

Receipts at four Eastern ports for this same week ending June 17 were:

	New York.	Boston.	Philadelphia.	Baltimore.
1881.	2,837,445	676,182	345,350	656,210
1880.	1,171,796	609,331	1,428,700	1,462,472

New York's total this year is 1,160,000 bushels more than the aggregate of the other three ports; last year it was 671,000 more. Of the receipts of New York this year 1,081,589 bushels, or 38 per cent., were by rail, against 1,024,488 bushels and 46 per cent. last year.

Coal Movement.

Coal tonnages for the week ending June 11 are reported as follows:

	1881.	1880.	Increase.	P. c.
Anthracite	430,636	401,277	29,359	7.3
Semi-bituminous	94,000	93,492	508	0.5
Bituminous, Penna.	45,546	32,365	13,181	40.7
Coke, Penna.	48,692	28,392	20,300	71.5

Semi-bituminous tonnage is very nearly the same as last year, the gain in Clearfield being about balanced by the loss in Cumberland. Shipments of the latter over the new George's Creek & Cumberland are beginning to be considerable.

The official accountant's statement of anthracite tonnages for May and the five months, differing somewhat in form from the weekly statements, is as follows:

	May.	1880.	Five months.	1880.
Phila. & Reading.	534,064	452,403	2,339,075	2,150,631
Lehigh Valley	415,681	325,368	2,013,990	1,561,640
Central, of New Jersey	290,480	225,348	1,471,399	1,243,304
Delaware, Lackawanna & Western	301,600	251,993	1,580,496	1,334,102
Del. & Hudson	214,866	174,078	1,176,339	1,072,198
Canal Co. of Pa.	194,921	120,465	823,674	564,080
Pennsylvania R. R. Co.	90,062	69,657	464,446	395,824
N. Y., Lake Erie & Western	36,008	31,768	179,860	152,691
Total	2,080,742	1,651,080	10,049,258	8,475,479

Increase for the month, 435,662 tons, or 26.4 per cent.; for the three months, 1,573,779 tons, or 15.6 per cent. All the companies show gains both for the month and for the five months.

The stock of coal on hand at tidewater shipping points on May 31, 1881, was 562,719 tons; on April 30, 1881, 528,198 tons; increase, 34,521 tons, or 6.5 per cent. during the month.

THE SCRAP HEAP.

Locomotive Building.

The Boston & Albany shops at Springfield, Mass., last week turned out a new heavy freight engine.

The Baldwin Locomotive Works, in Philadelphia, have recently shipped a number of locomotives to Mexico. They have on hand almost ready to ship several steam motors for a street railroad in Sydney, Australia.

The Philadelphia & Reading shops, in Reading, Pa., have lately turned out two heavy passenger engines to be used on the Bound Brook Line. Another new passenger engine and a shifting engine are nearly finished.

Car Notes.

The McCaskey Car Wheel Co. has been organized at New Castle, Pa., to make car wheels under a patent granted to Mr. John McCaskey.

The Boston & Albany shops at Allston, Mass., are building 10 new passenger cars for the road.

The Ontario Car Works in London, Ont., are running overtime, and have orders for a large number of cars to fill.

The New York Central & Hudson River shops at West Albany, N. Y., have recently turned out a number of new passenger cars for the road.

Iron and Manufacturing Notes.

Monocacy Furnace, in Berks County, Pa., has started up after a stoppage of several weeks for repairs.

Stack No. 1, of Dunbar Furnace, in Fayette County, Pa., has gone into blast.

The Stow Flexible Shaft Co., of Philadelphia, has several important railroad contracts on hand, and is full of orders for the entire run of its shafting and special tools.—*North American Manufacturer.*

Molson's Rolling Mill in Montreal, Canada, which has been idle four years, has recently been sold to Montreal capitalists, and will be started up as soon as it can be put in order.

The Vulcan Iron Works, Chicago, are building a large steam pile-driver for the Illinois Central road.

Wilson, Walker & Co., Pittsburgh, have recently added to their works a new steam hammer, which will be run on car axles.

The Crescent Tube Co. has sold its works at Soho, near Pittsburgh, to Joshua Rhodes & Co., owners of the Pennsylvania Tube Works.

The Atlas Works, Limited, are building an equipment of shears, hammers and pick machines for the Standard Tool Co., St. Louis; also, a large pair of shears for Wilson, Walker & Co., and a large quantity of general machinery for the Edgar Thomson Steel Works and others. Running night and day.—*Pittsburgh American Manufacturer.*

Dilworth, Porter & Co., of Pittsburgh, are running steadily, with a number of orders to fill.

The new furnace at Clipper Gap in Placer County, Cal., is making 30 tons of iron a day, said to be of superior quality. Charcoal is used for fuel.

The Rail Market.

In steel rails some heavy transactions are reported, including one sale of 20,000 tons at \$60 per ton delivered in Savannah next winter. Current quotations are \$55 to \$60 per ton at mill, according to time of delivery. English steel rails are reported to have sold at from \$61.50 to \$63, delivered at Southern ports.

Iron rails are active and a number of sales are reported at \$46 to \$50 per ton at mill, according to section, the time of delivery also having some effect on the price.

Old iron rails are lower and prices very variable, \$24.50 to \$26 being quoted in Philadelphia.

A Large Lake Steamer.

The steamer "Rufus P. Ranney" was successfully launched from W. H. Radcliffe's ship yard about 4 o'clock yesterday afternoon. The spectators were unusually numerous. When the vessel touched the water the tugs "Forest City," "Florence" and "Worswick" vied with each other for the honor of making the most noise with their whistles. The steamer drew 3 ft. 9 in. fore, and 9 ft. 4 in. aft, with an average draft of nearly 6 ft. 7 in., without her anchors and chains aboard. Her dimensions are as follows: Length of keel, 248 ft.; over all, 265 ft.; width of beam, 35 ft.; and depth of hold, 18½ ft. She is masted, and has cabins both fore and aft. The main keelson is 16 in. square; two sister keelsons, 12 by 16 in.; two rider keelsons, 14 by 14 in.; and six floor keelsons on each side, from 14 to 10 in. thick. The ceiling is 6 in. thick. The planking is 4½ in. thick all over. The garboard streak is 6 in. thick; next to the garboard, 6 in., bilge streaks, 5 in.; two fender streaks, 6 in., and two top side streaks 5 in. thick. Her lower deck beams are 8 in. deep, and the upper deck beams 8 in. deep. She is diagonally iron-strapped. One chord running with the sheer is 10 by 1 in., and one of the form of an arc is 10 by 1 in., to both of which the diagonal strapping is hitched. Her machinery was made and furnished by the Globe Iron Works. The engine is compound, with 30 and 56-in. cylinders and a 48-in. stroke. Her boiler house is of iron. She is built to carry 1,700 tons of iron ore on a draught of 14 ft.—*Cleveland Herald, June 16.*

The English Channel Tunnel.

A dispatch from London, June 17, says: "Sir Edward Watkin, Chairman of the Southeastern Railway Company, has informed a meeting of that company that two experimental shafts for the proposed Channel tunnel have been sunk on the English side and two on the French side, and that from one of the shafts on the English side a gallery 800 or 900 yards long and seven feet in diameter had been driven. The progress during the last week has been 67 yards, which is equal to two miles yearly. They have thus solved the question of the rate of progress for the experimental gallery, and ascertained that the lower strata is impermeable to water."

"The French experiments have obtained exactly the same result. They had arrived, he said, at an understanding with the French tunnel committee that on each side of the channel a further heading of a mile should be driven. When these headings are finished, which certainly ought to be in six months, one-tenth of the question would have been dealt with, and a further treaty would then probably be proposed, under which each party would accomplish the remaining nine miles on its side in view of meeting in the middle of the channel. A seven-foot gallery ought, on this system, to be completed in five years."

Damages by the Foot.

About 30 years ago, shortly after the completion of the Fitchburg Railroad, and during the presidency of Mr. Foster, an inward-bound passenger train ran off the old pile bridge between the hospital and Prison Point, there being no guards on the bridge. It was about half tide, no one was injured, but all got more or less scared and wet. On hearing of the accident Dr. Adams, of Waltham, a director in the corporation, started at once for Boston to see President Foster and advised him to send for all the passengers and settle with them on the best terms possible. People had not then learned to bleed railroad corporations. President Foster settled with all the passengers but one on terms ranging from \$5 to \$20 each. The exception was a sailor, who was an acquaintance of the conductor. Mr. Foster told the conductor to find that man and bring him to the office. The conductor found him and brought him before Mr. Foster, not knowing for what purpose he was wanted. The following interview then took place:

"Well, my man, you were on board that train that went off the bridge?"

"Yes, sir."

"Well, you were considerably scared?"

"No, sir."

"Well, you got wet?"

"Yes, sir."

"Well, we want to settle with you. What are you going to charge?"

"Well," said the sailor, "you see, mister, when I went down in the water I looked up to the bridge and calculated that we had fallen 15 feet, so if you will pay me a dollar a foot I will call it square." This is the only instance on record where a railroad corporation settled damages by the foot.—*Boston Traveller.*

OLD AND NEW ROADS.

Alabama, New Orleans & Texas Pacific Junction.—London dispatches state that a company by this name has offered for subscription £150,000 preferred stock as a first installment. The company is not known here; possibly it may be an organization of the Erlanger syndicate to extend the Alabama Great Southern from Meridian to New Orleans, of which there has been much talk of late.

Augusta & Knoxville.—A dispatch from Augusta, Ga., June 19, says: "The directors of the Augusta & Knoxville Railroad held a meeting yesterday. The proposition of the Baltimore & Ohio Railroad to subscribe \$200,000 to the stock of the road, the money to be used to build a branch to Elberton, was declined by a unanimous vote. The city of Augusta will retain control of its stock, and neither the

Baltimore & Ohio Railroad nor the Clyde syndicate will get it."

Boston, Revere Beach & Lynn.—At a special meeting in Boston, June 16, the stockholders voted to authorize an increase of \$150,000 in the capital stock, making it \$500,000. The new stock is to be used for improvements and new equipment. It was announced that 700 of the 1,500 shares would be issued this season, and this stock will be distributed among the stockholders at par; so that every person holding five shares should be entitled to one new share at par.

Canada Southern.—At Syracuse, N. Y., June 17, Judge Wallace, of the United States District Court, who has had under consideration for some time the case of the Canada Southern Railroad Company against the International Bridge Company, rendered a decision. The litigation was for the purpose of deciding the rate of compensation to be paid by the plaintiff for the use of the bridge of the defendant. The plaintiff claimed that a law of Congress of 1870 gave the Judge of the district power to decide the rate of tolls to be paid, which was denied by the Bridge Company, who claim that even if Congress conferred that power it was unconstitutional. Judge Wallace, in an elaborate opinion, holds that, assuming that Congress intended to confer on the Court authority to prescribe the compensation which the Bridge Company might charge, no doubt is entertained of the constitutionality of the act; but in his opinion Congress did not intend to confer such power. He dismisses the petition of the Railroad Company, with costs. The effect of this decision is to allow the Bridge Company to fix its own rates of toll.

By this decision we believe the Canada Southern becomes liable for a payment of about \$200,000 of accumulated tolls.

Central, of New Jersey.—This company has completed an extension of the Long Branch Division from Point Pleasant, N. J., southward three miles to Bay Head, at the northern end of Barnegat Bay. The Long Branch Division is now 52 miles long, from Elizabethport to Bay Head.

Notice is given that the American Dock & Improvement Company loan will be paid off Dec. 31 next, and interest will cease from that date. Holders have the option until July 1 of taking new bonds of the company in exchange for the old bonds.

The company has placed with Drexel, Morgan & Co., of New York, \$5,000,000 new 5 per cent. bonds of the American Dock & Improvement Company, guaranteed by the Central Railroad Company. Of the money received for these bonds \$4,000,000 will be used in paying off the old 7 per cent. bonds, leaving a balance of \$1,000,000, which will, it is understood, be used to pay off floating debt. It is stated that this amount, with the surplus in the Receiver's hands, will be sufficient to clear off the debt, so that the Receiver can be discharged and the road returned to the company.

Central Pacific.—Mr. Theophilus French, Commissioner of Railroads in the Interior Department, who recently went to California to investigate the affairs of this company, has addressed a letter to Gov. Stanford, President of the company, stating that he has found it in a satisfactory condition, and that he believes it fully in condition to meet all its obligations to the government. He will, therefore, recommend that the suit to enjoin the company from paying the dividend last declared be discontinued.

The publication of this letter in advance of any report to the Department, has caused much comment.

Chester, Iron Mountain & Western.—This company has been organized to build a railroad from St. Mary, Mo., on the Mississippi opposite Chester, Ill., west by Farmington and Iron Mountain to Salem, on the St. Louis, Salem & Little Rock road. There is also to be a branch from Farmington to Bonne Terre. The object is to develop the lead and iron deposits on the proposed line, and to carry coal from the river.

Chicago, Milwaukee & St. Paul.—The Yankton line, the old Dakota Southern, which was almost destroyed by flood three months ago, has been repaired, and on June 16 the first train since March 26 went through from Sioux City to Yankton.

It is proposed to build a branch from Hastings, Minn., to Stillwater, about 25 miles. The town of Stillwater has offered \$75,000 bonus for the road, and the company will probably accept the offer.

Chicago, Pekin & Southwestern.—In the foreclosure case of the Farmers' Loan & Trust Company against this company, an order has been made by Judge Drummond confirming the recent sale of the road under the second mortgage. The confirmation of the sale was made subject to the power of the Court to require of the purchaser such additional sum or sums of money as may be deemed necessary to liquidate the claims which have been or may be allowed by the Court as valid claims against the property and which may be directed by the Court to be paid.

Chicago & West Michigan.—This company has just issued a circular to its stockholders from which is taken the following: "The original Chicago & Michigan Lake Shore Railroad Company, of which the Chicago & West Michigan Railroad Company is the successor, was designed to take lumber and forest products generally from Western Michigan and to deliver them directly to consumers at interior points, by an all-rail route, as against lake carriage and reshipment. This has never been fully accomplished by its single connection with the Michigan Central Railroad, a fact fully appreciated both by the directors of the company and its predecessor. The Grand Rapids, Newaygo & Lake Shore Railroad, the Grand Haven Railroad and the Muskegon Lake Railroad have, however, now been secured in the interest of the company, and the way is therefore open to the extension of the Chicago & West Michigan Railroad to direct natural outlets to the south, east and west. As respects these outlets the geographical position of the Chicago & West Michigan Railroad is peculiarly favorable. By extending 35 miles south it can make connections with no less than 7 lines, reaching the more important interior lumber-consuming points. To provide the means for this and other contemplated extensions the purchase of the roads above mentioned, new equipments, depot ground at Grand Rapids, etc., etc., it is proposed to mortgage the property, its branches and extensions, at a rate not exceeding \$12,000 per mile, with the power to issue bonds under such mortgage bearing interest at 5 per cent. per annum, and having 40 years to run; enough of said bonds to be reserved to retire all the existing incumbrances upon any portion of the road and branches, viz:

Chl. & Mich. Lake Shore first-mortgage bonds..... \$480,000
Gd. Rapids, Newaygo & Lake Shore bonds..... 770,000

Total.....\$1,250,000

"It is proposed to issue at present bonds to the amount of \$2,050,000, and to offer the same to the stockholders of the Chicago & West Michigan Railroad Company upon the following terms: Each holder of 50 shares of the Chicago & West Michigan Railroad Company stock to be entitled to take a \$1,000 first-mortgage 40-year 5 per cent. bond

(of this company or of its successors) at 95 per cent. The bonds of \$1,000 each, with semi-annual coupons, will be issued as soon as the details can be arranged and legal papers prepared. Payments, under subscriptions, to be represented by negotiable receipts, and interest allowed on payments at 5 per cent. per annum; 25 per cent. to be paid on July 15, and the balance in three equal instalments on the 15th of each of the three succeeding months. The subscription for the above bonds is now offered to holders of record on June 28, 1881, until July 8, 1881, and any part not taken on or before July 8, 1881, will be disposed of by the directors of the company."

Cincinnati, Indianapolis, St. Louis & Chicago.—This company has opened a new line between Chicago and Louisville in connection with the Ohio & Mississippi, the new Vernon & Greensburg road supplying the connecting link.

Clinton & Faison.—This company has been organized to build a railroad from Clinton, the county seat of Sampson County, N. C., east to Faison on the Wilmington & Weldon road, a distance of about 15 miles.

Columbus & Hocking Valley.—A dispatch from Columbus, O., June 19, says: "For some time rumors have been afloat that a movement was on foot looking to the building of another railroad to the coal fields in the Hocking Valley region, which would compete for the coal trade, which has grown to enormous proportions within the past few years. A syndicate was formed in Cleveland, which has bought up some of the finest coal lands in the state, including 10,000 acres near New Straitsville, one of the heaviest shipping points on the Hocking Valley Railroad. A few days ago articles of incorporation were filed with the Secretary of State by Cleveland capitalists—Charles Hickox, Henry B. Payne, J. H. Wade and others—for the purpose of constructing a railroad from this city to the coal regions, the line to run almost parallel with the Hocking Valley Railroad. The capital stock of the new line was placed at \$6,000,000, and the right of way was already being secured. The directors of the Hocking Valley system, which includes the Columbus & Toledo and the Ohio & West Virginia railways, learned of the true state of affairs and recognized the fact that a new competing line, with such valuable coal lands, could do no less than seriously affect the revenues of their line. The Cleveland syndicate made propositions to purchase the controlling stock of the various lines under the Hocking Valley management. The price to be paid, it is understood, is 180 for the Hocking Valley and 125 for the Columbus & Toledo. The price has not yet been settled upon for the Ohio & West Virginia stock. The length of the Hocking Valley road is 112 miles, the Columbus & Toledo, 117 miles, and the Ohio & West Virginia, 83 miles. The two first mentioned have long been regarded as the best paying and most valuable railroad property in the state. It is understood that the new management will not remove the present officers, and that M. M. Greene will continue as President for five years."

The offer to take stock of the three companies is to remain open to all holders until July 1. It is stated that on June 20 a majority of the stock had already been offered to the Cleveland syndicate.

Cuba & Bolivar.—The line of this projected road is from Cuba, N. Y., on the New York, Lake Erie & Western, south by east to the Pennsylvania line in Bolivar. It is nearly parallel to the Friendship & Bolivar, now under construction.

Danville & New River.—At a meeting of the directors in Danville, Va., June 16, arrangements were completed for issuing \$200,000 bonds for the completion of the road. It is stated that subscriptions for \$100,000 have already been received.

Detroit Union Depot.—Articles of incorporation have been filed by the Detroit Union Railroad Depot & Station Company, with a capital stock of \$3,000,000. The purpose is to buy land and to build and maintain a Union depot and yards in Detroit and the approaches to the same. It is intended to provide accommodation for all the railroads entering Detroit.

East River & Connecticut.—This company has been organized to build a railroad from Port Morris, on the Harlem River in New York, to Portchester, with a branch from Pelham north by White Plains to a connection with the New York & New England. The company expects to use right of way and old grade belonging to the old New York, Westchester & Boston Company.

Friendship, Bolivar & Olean.—Work has been begun on this road, which is to run from Friendship, on the New York, Lake Erie & Western road, nearly due south to Bolivar, about 18 miles.

Galveston, Harrisburg & San Antonio.—The Commercial and Financial Chronicle says: "It is announced that the Southern Pacific of California, or parties interested in that company, have purchased a controlling interest in the stock of the Galveston, Harrisburg & San Antonio road. This road is now nearer to El Paso than any other Texas line, and when the El Paso connection now building is made, the Southern Pacific will have an outlet to the Gulf of Mexico."

Genesee Valley.—A contract for grading the first section of 36 miles from Rochester, N. Y., has been let to Gilbert Peterson, of Lockport, N. Y., who will begin work this week. The road will be built on the line of the Genesee Valley Canal.

An agreement has been concluded with the New York, Lackawanna & Western as to the crossing of the two roads in Livingston County. Negotiations are pending for the use of this road to Rochester by the New York, Lackawanna & Western.

Hannibal & St. Joseph.—A dispatch from Jefferson City, Mo., says: "At a meeting of the Fund Commissioners, held June 13, it was agreed to accept from the Hannibal & St. Joseph Railroad Company \$3,090,000, to be credited on account of the liability of the railroad to the state for bonds, issued under the act of 1865, to the company to the amount of \$3,000,000. The \$90,000 pays the interest until July 1. This acceptance does not give the company a clear receipt or release the state's lien on the road, but merely credits the company with the above amount as paid on account."

Houston & Texas Central.—Notice is given that the income and indemnity bonds will be paid at the company's office in Houston, Tex., July 22, and that all interest will cease from that date. These bonds bear 7 per cent. interest; there were \$2,500,000 of them issued.

It is reported that this company will build a branch from McAdams to the Austin Branch southward by Bastrop and Gonzales to Cuero, the terminus of the Gulf, Western Texas & Pacific road. The distance is about 80 miles.

International and Great Northern.—Track on the Laredo Extension has now reached a point 44 miles west by south from San Antonio, Tex.

Jersey Shore, Pine Creek & Buffalo.—This company offers to build its road from Port Allegeny, Pa., on the Buffalo, New York & Philadelphia road, east to Coudersport,

16 miles, provided the people on the line will subscribe \$50,000. The road was partly graded several years ago.

Lake Shore & Michigan Southern.—In the suits relating to the taxes assessed and to be assessed upon this company in Michigan, the Supreme Court of that state has decided that the tax cannot be imposed under the general law, but must be levied under the provisions of the charter of the old Michigan Southern Company. Further, taxes can only be levied on such portion of the stock and debt as represents the road in Michigan and not upon the whole amount of stock, the state having no power to assess taxes on property beyond its limits.

Manhattan Elevated.—Attorney-General Ward has refused to withdraw the suit begun by him in the name of the state for the dissolution of this company and the appointment of a receiver. He claims that there are sufficient grounds for the suit, and that his duty to the state requires that it should be prosecuted.

Missouri, Kansas & Texas.—The New York World says: "The following is a statement respecting the issue of stocks and bonds of the Missouri, Kansas & Texas Railway Company on account of extensions and acquisitions in Texas:

	Stock.	Bonds.
Issued and delivered upon 94 miles as follows: 42 miles from Denison to Gainesville, 52 miles from Denison to Greenville.....	\$1,880,000	\$1,880,000
To be issued on 53 miles from Greenville to Mineola.....	1,000,000	1,060,000
Total on 127 miles.....	\$2,940,000	\$2,940,000

In addition to the above there has been issued in exchange for International & Great Northern stocks, new stock amounting to.....13,430,000

Total new stock and bonds.....\$16,370,000 \$2,940,000

"Representing the acquisition and control by the Missouri, Kansas & Texas Railway Company of 749 miles of additional railway in Texas.

"The bonded indebtedness upon the 622 miles of International & Great Northern Railroad is:

First-mortgage 6 per cent. bonds.....	\$6,434,000
Second-mortgage 6 per cent. bonds.....	5,534,000

Total (\$19,241 per mile).....\$11,968,000

"It is expected that the connection lately made with the International & Great Northern Railroad at Mineola, Tex., will be the means of largely increasing the earnings upon the Missouri, Kansas & Texas Railway proper, because it will enable the latter to control the business tributary to the International & Great Northern line, which business heretofore has entirely gone over other lines."

Missouri Pacific.—Track on the Lexington & Southern Division is now laid to Lamar, Mo., and trains have begun to run to that point. Lamar is 25 miles south of the late terminus at Nevada and 94 miles from the junction with the main line at Pleasant Hill. Nearly all the grading is done to Carthage, 25 miles south of Lamar.

Mobile & Alabama Grand Trunk.—Notice is given that holders of securities should deposit them with the Farmers' Loan & Trust Company in New York before July 1, if they wish to join in the reorganization.

Nashville, Chattanooga & St. Louis.—The Chattanooga Times says: "Chattanooga can well congratulate herself on her extreme good fortune in at last gaining for her railroads the recognition she deserves, and receiving at their cost the finest railroad buildings in the South, such as are justly due the railroad centre of the South. The contract has been let and work commenced last week for the erection of a magnificent union passenger depot opposite the Read House, at a cost of \$30,000, and Mr. W. C. Smith, of Nashville, the architect of the depot, is now engaged in preparing plans and specifications for a freight depot for the Nashville & Chattanooga Railway. It will be located just west of the new depot, at the corner of Ninth and Chestnut streets. The building will have a front on Ninth street, 45 feet, and will be 300 feet deep, two stories in height, with an exterior front exactly similar to the passenger depot, with which it will be connected by a courtyard. The estimated cost of the building will be about \$20,000. The plans will probably be finished this week, after which bids will be advertised for and the contract awarded a few days afterward. The work will be pushed forward as rapidly as possible, and be finished early in November."

This company makes the following statement for May and the eleven months of its fiscal year from July 1 to May 31:

	May.	Eleven Months.
Gross earnings.....	\$164,430.45	\$1,949,419.14
Expenses.....	100,015.20	1,185,180.08
Net earnings.....	\$64,415.25	\$764,239.06
Interest and taxes.....	30,494.78	433,036.10
Surplus.....	\$34,920.47	\$331,202.96
Improvement acct. N. W. Div.....	\$170,021.78	
New iron bridges.....	26,144.85	
New engines.....	27,036.10	
New cars.....	151,635.00	
Real estate.....	24,391.50	
		399,249.23

Excess of payments.....\$68,046.27
The surplus has been expended in permanent improvements and additions to the property.

New Bonds.—New issues of bonds are offered on the market as follows:

Ft. Madison & Northwestern bonds, offered some months ago, are again offered by George K. Sistar's Sons, of New York. The total issue is \$700,000, of which it is said that \$200,000 have been sold. The road is of 3 ft. gauge, and is finished a short distance west from Ft. Madison, Ia. The new issue is to carry the road to a point 100 miles from Ft. Madison.

Toledo, Ann Arbor & Grand Trunk first-mortgage 6 per cent. 40-year bonds are offered at 102½ and interest by Anthony, Poor & Oliphant, of New York. The total issue is \$1,260,000, or \$15,000 per mile. The road is in operation from Toledo, O., to Ann Arbor, Mich., 46 miles; the new issue is to extend it from Ann Arbor to the Grand Trunk at Pontiac, 28 miles.

Nebraska, Topeka, Iola & Memphis.—This company has been organized to build a railroad from Topeka, Kan., southward by Iola to Girard and thence across Missouri and Arkansas to the Mississippi opposite Memphis; also from Topeka north to Lincoln, Neb. A survey from Topeka to Girard will be made at once.

New York, Lake Erie & Western.—A dispatch from Harrisburg, Pa., June 20, says: "A decision was rendered by the Supreme Court to-day against the claim of the Commonwealth that the New York & Erie Railroad Company was liable to increased taxation by reason of additional improvements made to its 42 miles of road in this state. Under the act of 1846 the company reported the cost of the construction of its road in this state at over \$2,170,000. This

act requires the company to pay the same taxes on capital stock as other corporations in this state pay. The Auditor-General claimed that additional improvements required the taxation of a greater amount of stock, amounting to about \$5,000 more a year. According to the act of 1874 the Supreme Court decided that this law repeals the act of 1846.

New York & New England.—The Boston Advertiser says: "The extensive warehouse, 600 ft. long by 200 ft. wide, recently completed by the New York & New England Railroad Company on its South Boston flats, has proved inadequate to the rapidly increasing wants of the company, and a new warehouse on the opposite side of the dock will be immediately constructed. The new building will be about 560 ft. long and 200 ft. wide. In addition to this a new freight-house will be built just north of the present freight-house of the company on the flats, and will be 600 ft. long and 852 ft. wide. Dock No. 2 will be immediately extended 244 ft., making its total length 860 ft. As soon as the extension of this dock is completed, the warehouse on pier No. 1 will be lengthened about 200 ft."

"The company will also put under contract as soon as possible the new pier to be called pier No. 3, which will be 1,110 ft. long and 200 ft. wide; also, a building extending from Eastern avenue to Northern avenue for storage of lumber and hay."

"The filling of the 13-acre lot, bought of the commonwealth, and of the 50-acre lot, bought of the Boston & Albany Railroad Company, is under contract, and is now going on, and as soon as the buildings referred to above are completed, the company will have a large additional area on which to erect other buildings, which the growing wants of the company will probably require."

New York, West Shore & Buffalo.—Articles of consolidation of this company and the North River Railroad Company have been filed, the name remaining unchanged. The capital stock will be \$40,000,000, to be issued share for share for the old stock of the two companies.

Oconto & Shawano.—This company has filed articles of incorporation to build a railroad from Oconto, Wis., westward to Shawano, about 80 miles. The capital stock is to be \$100,000.

Ohio & Mississippi.—Receiver King's report to the Court for May is as follows:

Balance, May 1	\$70,123.25
Receipts from all sources	531,081.04
Total	\$601,204.29
Vouchers, etc., prior to Nov. 17, 1878	\$3,068.13
Vouchers, etc., under Receiver	525,666.49
	529,734.53

Balance, June 1

The receipts were \$1,926.51 greater than the disbursements for the month.

Olean, Bolivar & Eastern.—This narrow-gauge road is to run from Olean, N. Y., southeast to the Pennsylvania line in the town of Bolivar, about 18 miles. Grading has been begun.

Ontonagon & Brule River.—The contest over the land grant attached to this road has been decided by the Michigan Legislature in favor of the organization known as the Ontonagon & Brule River Company. This company, it is understood, will work in connection with the Wisconsin & Michigan Company, making the road part of the proposed extension of the Northern Pacific eastward to the Sault St. Marie.

Oregonian.—This company, which has a system of narrow-gauge roads in the Willamette Valley in Oregon, and has partly completed a connecting line to Portland, has made an agreement to lease its property to Mr. Henry Villard, who acts for the Oregon Railway & Navigation Company. The agreement includes the building of some extensions of the road, but the Portland line will not be finished.

Pennsylvania.—This company's statement for the month of May shows for all lines east of Pittsburgh and Erie, as compared with the same month in 1880:

An increase in gross earnings of	\$438,981
An increase in expenses of	227,223
Net increase	\$211,758

For the five months ending May 31, as compared with the corresponding period last year, the same lines show:

An increase in gross earnings of	\$1,533,808
An increase in expenses of	1,107,357
Net increase	\$426,451

All lines west of Pittsburgh and Erie for the five months of 1880 show a surplus over liabilities of \$1,682,183, being a gain of \$387,953, as compared with the same period last year.

Peoria, Decatur & Evansville.—Notice is published that a special meeting of the stockholders will be called to meet at the office of the company, in the city of Peoria, Ill., on Saturday, July 16, 1881, for the purpose of submitting to a vote a proposition increasing the capital stock of said company \$2,400,000, the said stock to be sold and the proceeds thereof to be used for the following purposes:

First. To purchase the Evansville & New Harmony railroad of Indiana, and to build and equip the same.

Second. To purchase for the Peoria, Decatur & Evansville Railway Company additional locomotive and freight-car equipment.

Third. To purchase land for additional terminal facilities in the city of Evansville and properly prepare the same for use.

Fourth. To purchase land on the line of the company for additional side tracks and extensions; and also to submit to a vote of said stockholders a proposition to remove the principal place of business of said corporation from Pekin to Peoria.

That the right to subscribe for the 24,000 shares of stock be offered pro rata to the stockholders of record June 25, 1881, at \$40 per share, such right or option to expire on the 1st day of August next.

The transfer books will close June 25, and reopen July 18, 1881.

Petersburg.—This road has, since May 10 last, been worked by the company, the Receiver having on that date delivered possession to the company under order of the United States Court. The liabilities, to satisfy which the sale of the road had been ordered, were adjusted, and the company reorganized as we have heretofore noted.

Pittsburgh & Western.—Articles of consolidation and merger of the following railroads have been filed with the Secretary of the Commonwealth at Harrisburg: The Pittsburgh & Western Railroad Company, the Pittsburgh East & West Railroad Company, the Pittsburgh & Northwestern Railroad Company, the Parker & Karns City, the Karns City & Butler Railroad Company, and the Pittsburgh, New Castle & Lake Erie Railroad Company. These roads are to form a continuous line, and to be known as the Pittsburgh & Western Railroad Company. The capital

stock is to be \$600,000, and the principal office is to be located in Allegheny County.

The completed road owned by the consolidated company (all of 3 ft. gauge) is the original Pittsburgh & Western, from Allegheny, Pa., to Wurtzburg, 47 miles; the Parker & Karns City, from Parker Junction, Pa., to Karns City, 10½ miles, and the Karns City & Butler, from Karns City to Butler, 17 miles.

Philadelphia & Reading.—The Receivers give notice that they will pay on July 1 the coupon then falling due on the general mortgage deferred sterling scrip; also that they will pay on July 11 the unpaid one-half of the July, 1880, coupon on the general mortgage bonds.

The following is the statement of the Receivers for May and the six months of the fiscal year from Dec. 1 to May 31, in the somewhat awkward form in which it is now presented:

Railroad Co.	Month.		Six months.
	Gross.	Net.	
R. Road traffic	\$1,520,840	\$695,807	\$3,427,656
Canal traffic	115,224	78,007	28,545
Steam colliers	45,680	4,328	96,947
Richmond barges	7,069	1,291	1,197
Total	\$1,688,802	\$779,523	\$3,554,045
Coal & Iron Co.			
Total receipts	902,458	46,331	295,186
Total	\$2,651,260	\$825,854	\$3,849,231

A comparison of net results is as follows:

Railroad Co.	Month.		Six months.
	1881.	1880.	
Railroad Co.	\$779,523	\$534,974	\$3,554,045
Coal & Iron Co.	46,331	11,636	295,186
Total	\$825,854	\$546,610	\$3,849,231

*Loss.

The expenses do not include rentals or interest. The net earnings represent the sum from which all such charges are to be paid.

A dispatch from Philadelphia, June 2, says: "The Receivers of the Philadelphia & Reading Railroad Company contemplate an application to the United States Court for permission to issue 4 per cent. certificates to an amount which will carry the floating debt of the company, the securities now in the hands of the creditors to be gathered into a trust for the purpose of protecting the same. Negotiations have also, it is said, been begun by which the Philadelphia & Reading is to form a coalition with the Buffalo, Pittsburgh & Western for the building of the Pine Creek road, but nothing definite has yet been decided upon."

Portsmouth & Cincinnati.—This company has been organized to build a railroad from Portsmouth, O., west to the terminus of the Cincinnati & Eastern road.

Providence & Springfield.—It is reported that the New York & New England Company has secured control of this road, which runs from Providence, R. I., west to Pascoag, 21 miles. The road is to be connected with the Woonsocket Division by a branch four miles long from Primrose to Woonsocket, but the most probable object of the purchase is to prevent the extension of the road.

Reading & Chesapeake.—This company has executed and put on record a mortgage on its proposed road to secure an issue of \$2,500,000 bonds. The road is to run from Reading, Pa., to Perryville, Md., opposite Havre de Grace, with a branch to New Holland, Pa. Surveys have been made, but no work done.

Richmond & Danville.—At a special meeting in Richmond, Va., June 18, the stockholders voted to ratify the lease of the Atlanta & Charlotte Air Line. The vote was unanimous.

Sabine & Western.—This company has been organized to build a railroad from Sabine Pass, Tex., to Houston, about 85 miles. The line is parallel to and south of the Texas & New Orleans road.

St. Louis Bridge.—Of this the Anglo-American Times in London reports: "On the Illinois side to the entrance comes the Wabash; on the Missouri side running over the St. Louis Tunnel Railway comes the Missouri Pacific; and now the two have joined in appropriating the bridge so as to connect the east and west systems by a continuous line of rails. The terms were settled last Tuesday, and the companies guarantee in perpetuity the existing status of the first-mortgage bonds, amounting to \$5,000,000 7 per cents., payable in London and New York, April 1 and Oct. 1, due in 1928. The stock amounts to \$7,990,000, of which \$2,490,000 is first preferred. To that the agreement awards 6 per cent., but to begin two years hence, till when 5 per cent. will be paid. The second preferred amounts to \$3,000,000, and on that 3 per cent. will be paid. Nothing is here said about the common stock, amounting to \$2,500,000, but the agreement, as regards the rest, provides a perpetual guarantee of the Wabash and of the Missouri Pacific."

St. Louis, Iron Mountain & Southern.—This company, it is stated, will soon begin work on several branches, which will cover pretty well the cotton country of Arkansas and extend into Northern Louisiana. One is to leave the road at Traskwood, 35 miles below Little Rock, Ark., and run southeast, nearly at right angles with the main line, through Sheridan, Warren and Hamburg to the Louisiana line, about 120 miles.

A second branch will start from Gurdon, 85 miles southwest of Little Rock, and run southeast through the Ouachita Valley to Camden, thence nearly due south by Eldorado, Ark., and Vernon, La., to Alexandria on the Red River and the New Orleans Pacific road. This branch will be between 190 and 200 miles long, taking in the very fertile valley of the Ouachita in Arkansas, and a fair but thinly settled section of Louisiana.

Another branch—the longest of all—is to start from a point below Corning, Ark., about 12 miles south of the Missouri line, and run southward to Forrest City on the Mississippi, but some 25 miles west of the river, through Arkansas and Louisiana, to Vidalia on the river, opposite Natchez, about 350 miles. This line will follow the Mississippi bottom and will make a river line from St. Louis to Natchez, and, with the Memphis & Little Rock, to Memphis. It is possible that a cross branch some 50 miles long may be built to connect with the Missouri Division and make a short line to Cairo. The first branch named above will connect with this near the line between Arkansas and Louisiana.

A fourth branch projected is from O'Kear, Ark., 28 miles south of the Missouri line, nearly due west, running parallel to the north line of the state by Pochontas and Salem to Carrollton, in Carroll County, nearly 150 miles. This branch reaches the high hill country of Northern Arkansas, where the crops are chiefly grain and tobacco, that is at the few points where there is anyone to raise crops.

These projected branches are in all from 950 to 970 miles, covering nearly all Arkansas except the extreme western section. Much of the country they will reach is undoubtedly fertile, but as yet thinly peopled. The branches will bring a good deal of business to the main line, especially if Arkansas continues to grow as it did in the last decade.

Salt Lake & Park City.—This company has been organized to build a railroad from Salt Lake, Utah, to Park City, with a branch to Coalville. The entire length of road to be built is 52 miles; capital stock, \$520,000. The road is understood to be planned as an extension of the Utah & Pleasant Valley road to Salt Lake.

Salt Lake & Western.—This company has been organized to build a narrow-gauge railroad from Salt Lake, Utah, through Nevada and California to San Francisco. The organization is at Carson, Nevada.

Southern Pacific.—This company is pushing very actively the work of construction from El Paso, Tex., southward. Grading parties are at work for many miles along the Rio Grande, and the construction train has reached Yuleta, 25 miles from El Paso.

Texas-Mexican.—Track on this road (formerly the Corpus Christi, San Diego & Rio Grande) is now laid to Aguilares, Tex., 132 miles from Corpus Christi. Work is progressing rapidly, and the track will, it is expected, reach Laredo on the Rio Grande, 163 miles from Corpus Christi, in July.

Texas & St. Louis.—On the extension of this road from Corsicana, Tex., to Waco, track is now laid from Corsicana southwest 10 miles. Work has also been pushed on the other end and track is now laid from Waco northeast 16 miles. The gap between the two ends of the track—about 28 miles—is all graded.

Utah Central.—Agreements have been concluded for the consolidation of the Utah Central, the Utah Southern and the Utah Southern Extension companies, under the name of the Utah Central Railroad Company. The ownership of the three is substantially the same, and they are all controlled by the Union Pacific. The Utah Central extends from Ogden, Utah, to Salt Lake, 37 miles; the Southern Extension from Juab to Frisco, 137 miles, making 279 miles in all. The Central and Southern have been very profitable lines; the Extension is still quite new. The stock of the consolidated company is to be \$4,225,000.

Valparaiso & La Crosse.—This company has filed articles of incorporation to build a railroad about 15 miles long from the Columbus, Chicago & Indiana Central near La Crosse, Ind., to the Pittsburgh, Ft. Wayne & Chicago near Valparaiso. The organization is controlled by the Pennsylvania Company. The proposed line is a short cross connection between the two roads.

Western North Carolina.—Mr. W. J. Best, who negotiated the purchase of this road from the State of North Carolina, is about to begin suit to recover it from the possession of the Richmond & Danville Company, to which it passed on his failure to repay advances obtained from that company. Mr. Best is now connected with the Midland North Carolina—an entirely distinct corporation from the North Carolina Midland—which is seeking to lease the Atlantic & North Carolina, and to connect that road with the Western by a new line from Goldsboro to Salisbury.

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Columbus & Toledo.

This company owns a line from Columbus, O., to Wallbridge, 118.2 miles, and it leases the use of 5.5 miles, from Wallbridge to Toledo, from the Pennsylvania Company, making 123.7 miles worked. It also owns valuable docks and terminal property in Toledo. It is an extension of the Columbus & Hocking Valley road and under the same management. The report is for the year ending Dec. 31, 1880.

The equipment consists of 18 locomotives; 14 passenger and 5 baggage cars; 224 box, 35 stock, 25 lime, 66 flat, 1,251 coal and 11 caboose cars. Additions during the year were 6 locomotives; 4 passenger and 1 baggage car; 50 box, 650 coal and 5 caboose cars.

The general account is as follows:

Stock	\$932,744.39
Installment interest scrip	8,906.82
Bonds	2,857,000.00
Bills payable	118,120.63
Accounts and balances	17,403.58
Contingent account	15,564.36
Total	\$3,949,829.78
Road and property	\$3,871,213.46
Bonds owned	9,919.04
Installment interest	5,800.57
Interest on dock purchase	27,940.50
Supplies	3,719.05
Cash and receivables	31,236.66
	3,949,829.78

Of the bonds \$2,474,000 are first and \$383,000 second-

